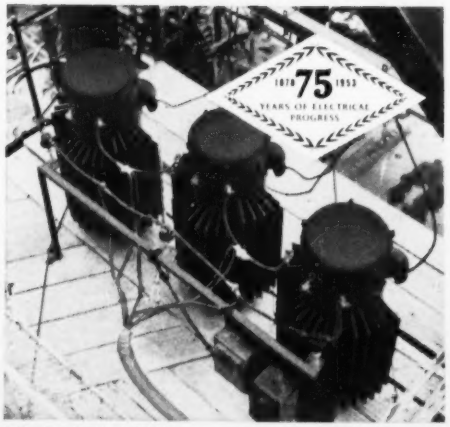
ENGINEERING NEWS-RECORD

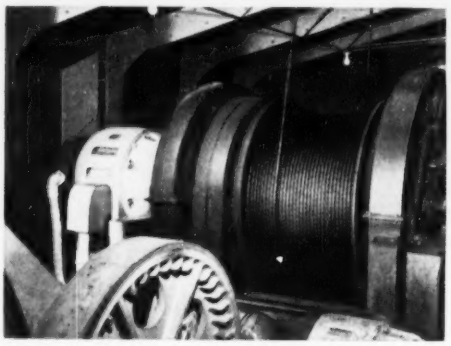
A McGRAW HILL PUBLICATION

ENGINEERING REPORTS:

ELECTRICAL CO-ORDINATION provides continuous operation of this revolver crane 100 feet above the base of the huge intake structure. Movement along trestle is powered by a G-E 200-hp Type MR motor at foot of the gantry.



ADEQUATE POWER to maintain smooth, dependable crane performance is stepped down by these portable G-E transformers.



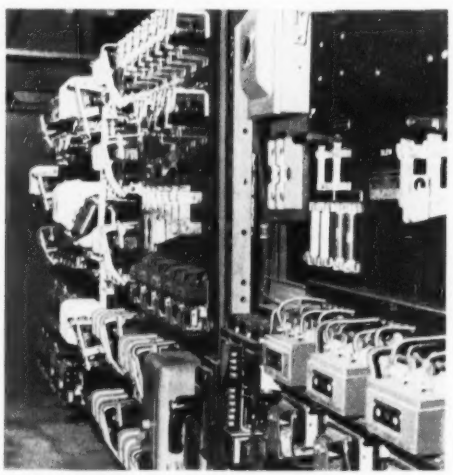
RELIABLE DRIVES must stand exacting demands of this revolver crane. G-E 200-hp motors and control are key to this application.

Electricity helps Garrison Dam keep round-the-clock schedule

G-E drives, still on the job after six years, are helping to harness Missouri River

At Garrison Dam near Bismarck, N. D., completely electrified equipment plays a vital role in keeping round-the-clock construction work on schedule. All electrical systems for the project's main stages were designed and co-ordinated by U. S. engineers, Peter Kiewit and Son Co., and Morrison-Knudsen Co. contractors—aided by G-E application engineering. This engineering teamwork resulted in maximum working capacity and fast, smooth operation.

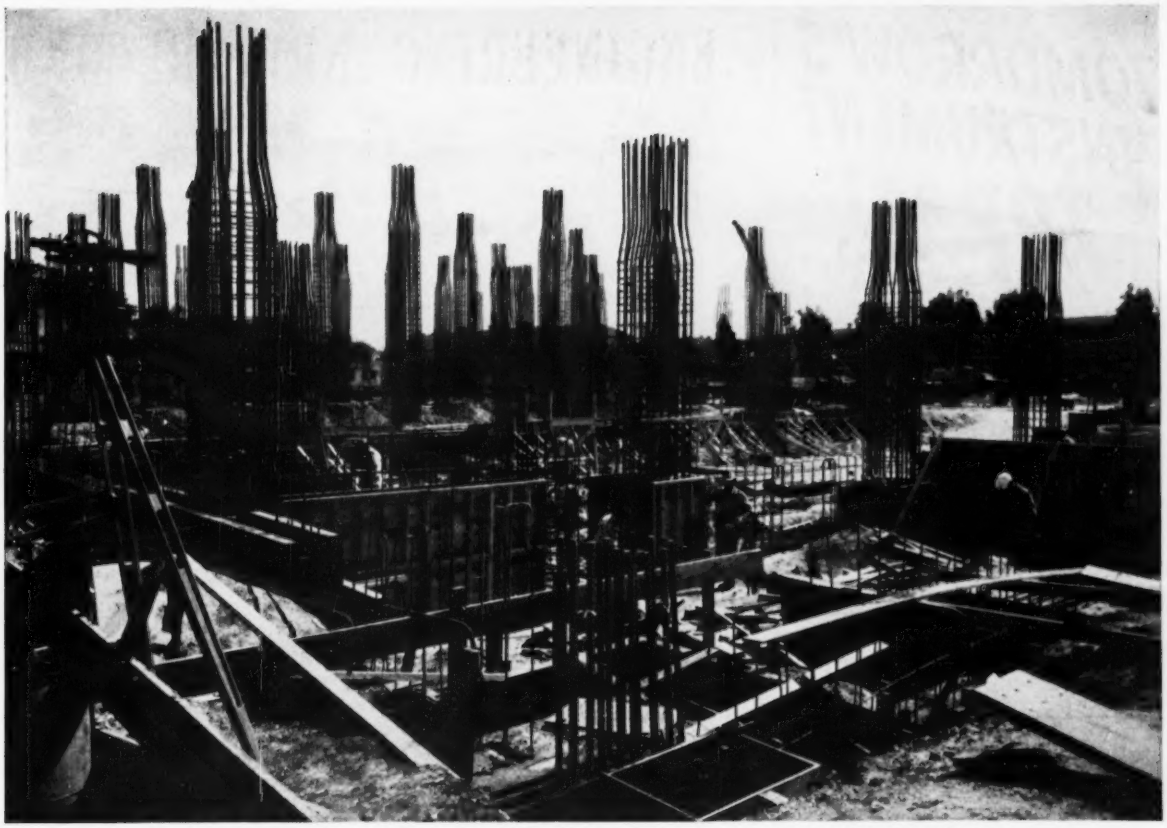
Let G-E application engineers help *you* get the most from your construction equipment through electrification—from the smallest drive to the largest power distribution system. Contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, New York. 664-31



CENTRALIZED CONTROL equipment on this compact G-E panel is mounted in the cab for simple one-man operation.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC



2200 tons of Bethlehem Reinforcing Bars go into the new electronics building, under construction at Mare Island Naval Shipyard, Vallejo, California. In the section of the building which is shown above, about 50 of the columns are being built in an area 200 ft by 168 ft.

REINFORCING BARS

When and Where You Want Them

BETHLEHEM BAR FABRICATING SHOPS

BOSTON
NEW YORK
PHILADELPHIA
JOHNSTOWN, PA.
BALTIMORE
BUFFALO
CHICAGO
ST. PAUL
LOS ANGELES
SAN FRANCISCO
SEATTLE

BETHLEHEM STEEL

When you specify Bethlehem Reinforcing Bars—in any tonnage, any standard size—you can count on the delivery of the bars keeping pace with your construction schedule.

This is because Bethlehem has the facilities to turn out large quantities of reinforcing steel in all commonly used sizes. What's more, our large bar-fabricating shops, eleven in number, are located in widely scattered areas throughout the country, to facilitate prompt shipment to construction projects.

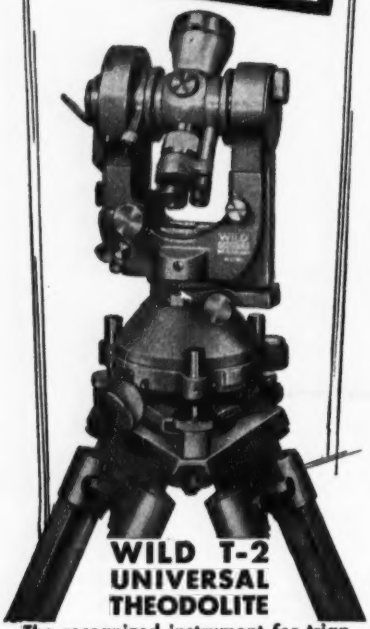
Bethlehem Reinforcing Bars are made exclusively from new-billet steel, of known analysis. They come in size ranges from number 3 to 11, with deformations meeting ASTM Spec. A-305. They are cut to length and bent in our shops, and reach you bundled and tagged, with bar lists included, ready for instant placing.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

TOMORROW'S INSTRUMENT TODAY!

WILD HEERBRUGG



WILD T-2 UNIVERSAL THEODOLITE

The recognized instrument for triangulation, bridgework and other precise engineering jobs... The Instrument For YOU.

You read both circles by microscope ...direct to one second. Every reading gives the mean of two diametrically opposite points of the circle, and is therefore free from eccentricity-errors.

The optical plummet makes centering above a ground point an easy and quick operation even on windy days. The telescope with its big field of view is "easy on the eye" and can be transited both ways.

Available accessories include battery box for night work, traverse targets, Invar Subtense Bar for optical distance measurement.

•

Choose WILD instruments for ease of operation, speed and accuracy.

•

WRITE OR PHONE FOR BOOKLET EN 1126

•

Extensive repair & servicing facilities by factory trained specialists.

HENRY WILD
SURVEYING INSTRUMENTS SUPPLY CO.
OF AMERICA, INC.
MAIN & COVERT STS., PORT WASHINGTON, N.Y.
PORt Washington 7-4843

ENGINEERING NEWS-RECORD

ABP Member

Editorial offices: 330 W. 42nd St., New York 36, Tel. LOngacre 4-3000

Number of copies of this issue printed: 61,447

Contents on page 17

Waldo G. Bowman

Editor

E. E. Halmos Jr. — *Managing Editor*

V. T. Boughton — *Transportation, Power*
F. S. Merritt — *Architectural, Structural*
R. H. Dodds — *Contracting, Heavy Construction*
S. C. Jensen — *Materials and Equipment*
A. J. Fox Jr. — *Hydraulics, Water Supply, Sanitation*
J. J. Christie — *National Affairs*
A. A. Layne — *Labor, Men and Jobs*
J. P. Chamberlain — *Business and Finance*
R. W. O'Neill — *International, Features*
J. R. Owen — *Municipal*
J. R. Carr — *Midwest (Chicago)*
L. L. Wise — *West (San Francisco)*
N. A. Bowers — *Consultant (San Francisco)*
Elsie Eaves — *Business News Department*
J. H. Webber — *Economics*
J. A. Mahoney, M. O. Wetzel — *Construction Reports*
M. W. Roessler, E. R. Huber, Dori Weiss — *Statistics, Costs, Prices*
G. T. Orick — *Copy Desk*
H. G. Compton — *Photography*
T. D. MacGregor, B. J. Lamb, M. V. Leggiero — *Copy, Rewrite, Layout*
L. T. Tarpey, J. C. Greenough — *Printing*

Washington News Bureau, Room 1189 National Press Building; G. B. Bryant, Jr., *Manager*, Glen Bayless, Jay Flocken, Boyd France, J. M. Gambatese, Sam Justice, W. H. Kearns, J. L. Kent, Craig Lewis, D. O. Loomis, Jesse Mock, Gladys Montgomery, A. L. Moore, M. A. Relchek, Caroline Robertson, V. B. Smith, W. B. Whichard, Jr.

Domestic News Bureaus: Atlanta, 1321 Rhodes-Haverty Bldg., E. D. White; **Cleveland,** 1510 Hanna Bldg., R. A. Cochran; **Detroit,** 856 Penobscot Bldg., S. H. Brams; **Houston,** 1303 Prudential Bldg., J. A. Lee; **San Francisco,** 68 Post Street, M. C. Ralston; **Los Angeles,** 1111 Wilshire Blvd., John Shinn; **Seattle,** 6040 Fifth Ave., N.E., Ray Bloomberg.

Correspondents: Albany, Albuquerque, Augusta, Me., Austin, Boston, Boulder, Baltimore, Birmingham, Bismarck, Charleston (W. Va.), Charleston (S. C.), Columbus, Cincinnati, Cleveland, Chicago, Cheyenne, Dallas, Denver, Detroit, Durham, Harrisburg, Helena, Houston, Hartford, Indianapolis, Jackson, Miss., Jacksonville, Jefferson City, Kansas City (Mo.), Lansing, Lincoln, Little Rock, Miami, Memphis, Minneapolis, Montgomery, Milwaukee, New Orleans, Norfolk, Omaha, Oklahoma City, Philadelphia, Pittsburgh, Portland (Ore.), Providence, Phoenix, Pierre, St. Louis, Schenectady, Syracuse, St. Paul, Seattle, Salt Lake City, Spokane, Topeka, Trenton, Wilmington. **Canada:** Montreal, Toronto, Ottawa, Victoria, Regina.

Foreign News Bureaus: J. K. Van Denburg, Jr., **New York;** G. W. Schroder, **Frankfurt;** Nathaniel McKitterick, **London;** Herbert Leopold, **Manila;** John Wilhelm, **Mexico City;** Ross Hazeltine, **Paris;** A. W. Jessup, **Tokyo;** L. I. Holmes, **Sao Paulo. Correspondents:** Amsterdam, Athens, Bangkok, Bogoto, Bombay, Brussels, Buenos Aires, Caracas, Copenhagen, Geneva, Havana, Helsinki, Johannesburg, Lima, Madrid, Melbourne, Oslo, Rome, Stockholm, Sydney, Tehran, and 21 other principal cities and countries.

Robert F. Boger

Publisher

November 26, 1953 ENGINEERING NEWS-RECORD Vol. 151, No. 22

Member ABC and ABP

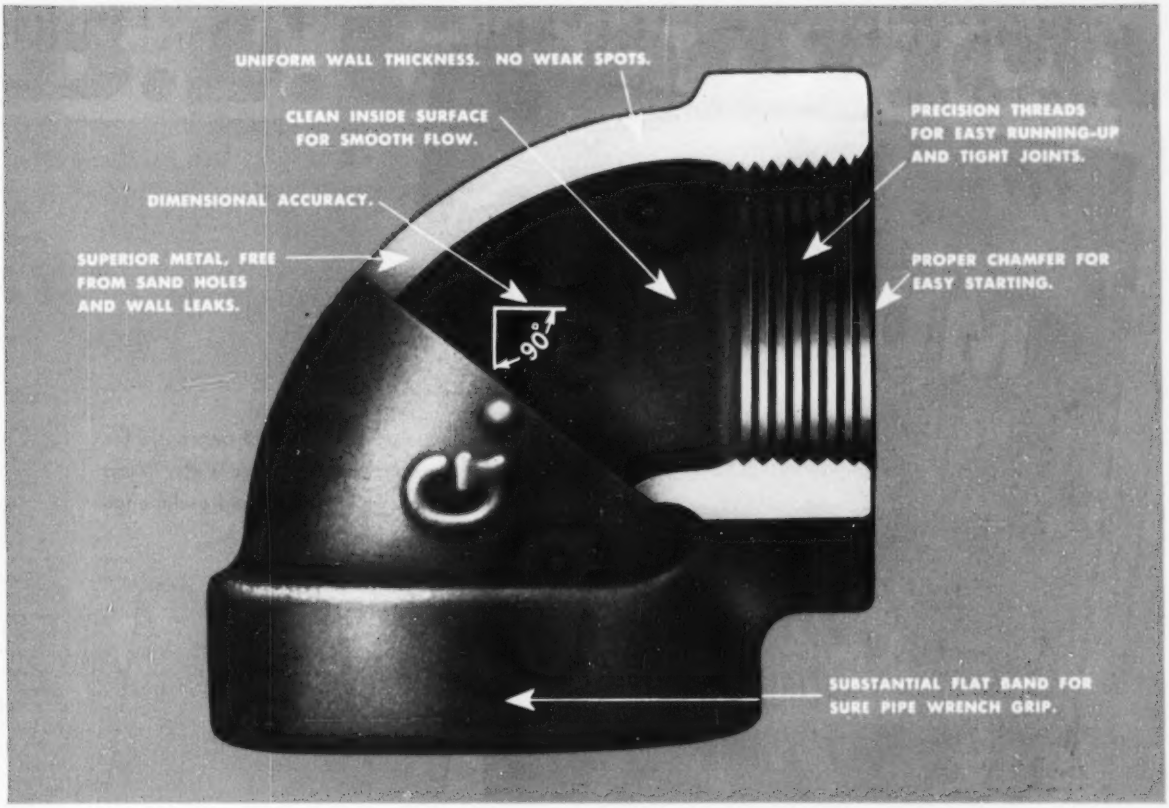
Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office, 99-129 North Broadway, Albany 1, N. Y.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Engineering News-Record—Subscription Service, 99-129 North Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address.

Subscriptions are solicited only from persons with an identifiable commercial or professional interest in construction and building. Position and company connection must be indicated on subscription orders.

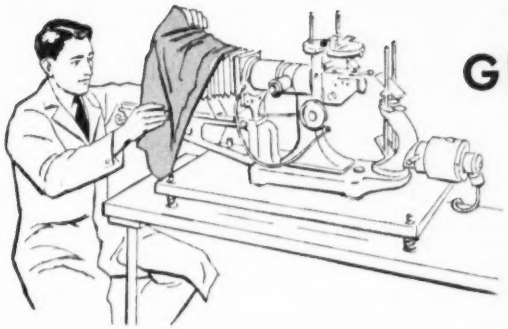
Single copies 35¢. Subscription rates—United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada, $8.00 a year; $12.00 for two years; $16.00 for three years. Other Western Hemisphere countries, $15.00 a year; $25.00 for two years; $30 for three years. All other countries, $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U. S. A. Copyright 1953 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.


UNIFORM WALL THICKNESS. NO WEAK SPOTS.
CLEAN INSIDE SURFACE FOR SMOOTH FLOW.
PRECISION THREADS FOR EASY RUNNING-UP AND TIGHT JOINTS.
DIMENSIONAL ACCURACY.
SUPERIOR METAL, FREE FROM SAND HOLES AND WALL LEAKS.
PROPER CHAMFER FOR EASY STARTING.
90°
SUBSTANTIAL FLAT BAND FOR SURE PIPE WRENCH GRIP.

Rigid Inspection

From foundry to finished fitting—modern inspection methods insure the quality of

GRINNELL PIPE FITTINGS



The "Photomicrograph"
By means of photomicrographs, the metal structure of castings is thoroughly checked for full information on production quality.

For instance, for malleable fittings, laboratory technicians make an hourly chemical analysis of foundry metal to insure uniform, high quality. Daily tests by photomicrograph reveal metallurgical structures. Sample bars from each melt are subjected to tensile strength tests . . .

Fittings must pass a 100% inspection both before and after machining. Quality control includes alignment tests, high pressure hydrostatic tests, and comparator checks on the accuracy of threads and chamfer.

That's why, when you specify Grinnell cast iron and malleable iron pipe fittings, you are sure of—

- High quality metal
- Dimensional accuracy
- Clean inside surface for smooth flow
- Proper chamfer for easy starting and protection of first thread
- Precision threads for easy running-up and tight joints

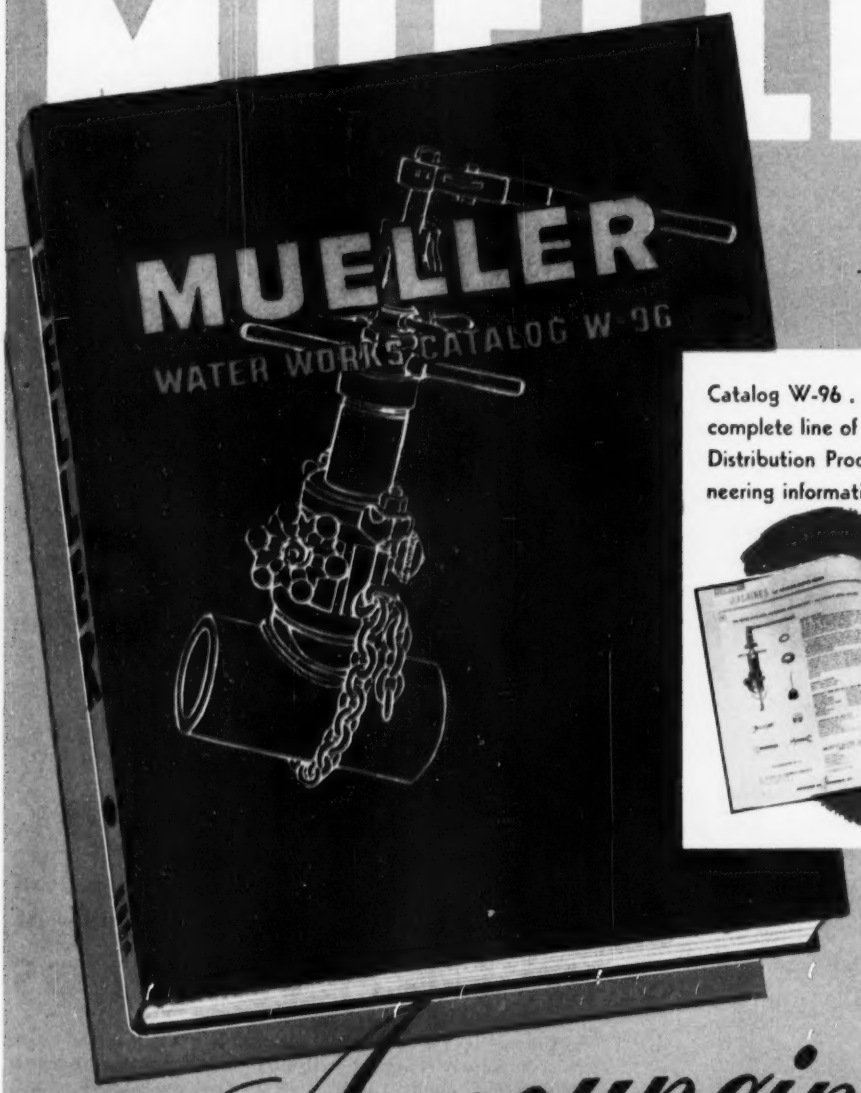
To make fittings the safest, strongest link in your piping system . . . choose from the wide Grinnell line. Available from your local Grinnell Distributor or a Grinnell Warehouse.

GRINNELL
WHENEVER PIPING IS INVOLVED

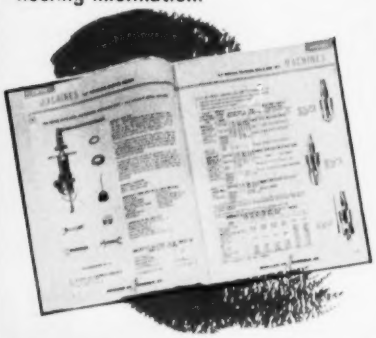
Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

MUELLER



Catalog W-96 . . . 328 pages . . . the complete line of Mueller Water Works Distribution Products and useful engineering information.



Announcing

the new Mueller Water Works Catalog

A new Mueller Water Works Catalog will be sent to you during the month of November. If you are in need of additional copies, drop us a line or contact your Mueller Representative.

Write Dept. A-36

MUELLER CO.

Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

B.F.Goodrich

"Universal tread prevents side-slip," construction foreman reports

THE Kessler Contracting Company does road construction work around Mount Carmel and Shamokin, Pennsylvania. Thirty trucks, 6 scrapers and 6 other units haul loads as heavy as 20 tons over hilly, rut-filled roads where tire skidding and side-slippage is a constant threat.

To avoid this danger, Kessler uses B. F. Goodrich off-the-road tires. Foreman Rufus Steiger (above, right) reports they prevent side-slip, give much better service than any other make of tire.

The B. F. Goodrich Universal tire grips with husky, wedge-shaped cleats. The cleats are non-directional to give positive traction in reverse or forward and to guard against slippage. You pull through the toughest jobs without wasting time and money on bogged-down trucks. And the tread is made of specially-compounded rubber that resists cuts and snags.

Kessler is able to recap its BFG tires twice—each recap saving the company hundreds of dollars—because of the extra-strong construction. Layers of strong, elastic nylon cords under the tread stretch together to protect the tire body from shocks and bruises. This patented nylon shock shield costs you nothing extra, yet gives you more original tire service, more recappable tires and more hours of service per recap, increased bruise resistance and less danger of tread separation.

See the complete money-saving line of B. F. Goodrich off-the-road tires at your retailer's store. The address is listed under Tires in the Yellow Pages of your phone book. Or mail the coupon.

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH MAKES B.F.Goodrich FIRST IN RUBBER

The B. F. Goodrich Company
Tire and Equipment Division
Department TO-288, Akron 18, Ohio

Please send me:

☐ Free catalog on B.F.Goodrich off-the-road tires
☐ Free booklet, "How to get more recaps out of truck tires"
☐ Name of my nearest retailer.

Name_____
Company _____
Street _____
City_____ Zone____ State_____

You'll have less infiltration . . .

reduce treatment costs . . .

conserve plant capacity . . .

Total infiltration in an all-Transite sewer system (over 5 miles of pipe) was so little the trickle had to be measured through a 3-in. pipe inserted in the Parshall flume!

—Because of this tight joint used with Transite® Sewer Pipe

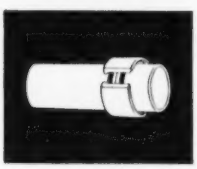
THE reduction of ground-water infiltration brought about by the Transite Joint—now standard on all sizes of Transite Sewer Pipe—can lead to a number of cost-saving results.

For example, on one recently installed Transite System using 28,540 feet of Transite Sewer Pipe, in diameters of 6 through 18 inches, the infiltration per inch of diameter, per hour, per mile of pipe came to a mere 0.85 gal. This low infiltration (including that from manholes and connections to house sewers) was achieved despite the fact that a considerable portion of this installation was below the prevailing ground water table. (For specification purposes, an infiltration allowance of 10 gallons per inch of diameter, per hour, per mile of pipe may be used with Transite Sewer Pipe.)

Obviously, such minimum ground-water infiltration helps reduce the load on treatment plants, cuts down on treatment costs, and conserves plant capacity for future expansion needs. This reduced infiltration plus Transite's high flow capacity (Manning's N=.010) often permits the use of smaller diameter pipe for new installations.

For further information on how this Transite Joint, used with corrosion resistant asbestos-cement Transite Pipe can help reduce your sewage costs, write Johns-Manville, Box 60, New York 16, N. Y. Ask for folder TR-103A.

Why this dependable joint cuts your sewage costs



Two rubber rings and Transite Sleeve (cut away) can be assembled quickly over Transite Pipe ends to make an effectively tight joint. These flexible joints effectively absorb vibration, help compensate for soil movements.

TIGHT ALL THE WAY

Johns-Manville Transite Building Sewer Pipe assures a tight sewer system throughout. Many municipal officials are insisting that house and building connections to their sewage lines be made with Johns-Manville Building Sewer Pipe to assure tightness throughout their systems. This pipe also has the rubber ring sealed joint that is shown above.

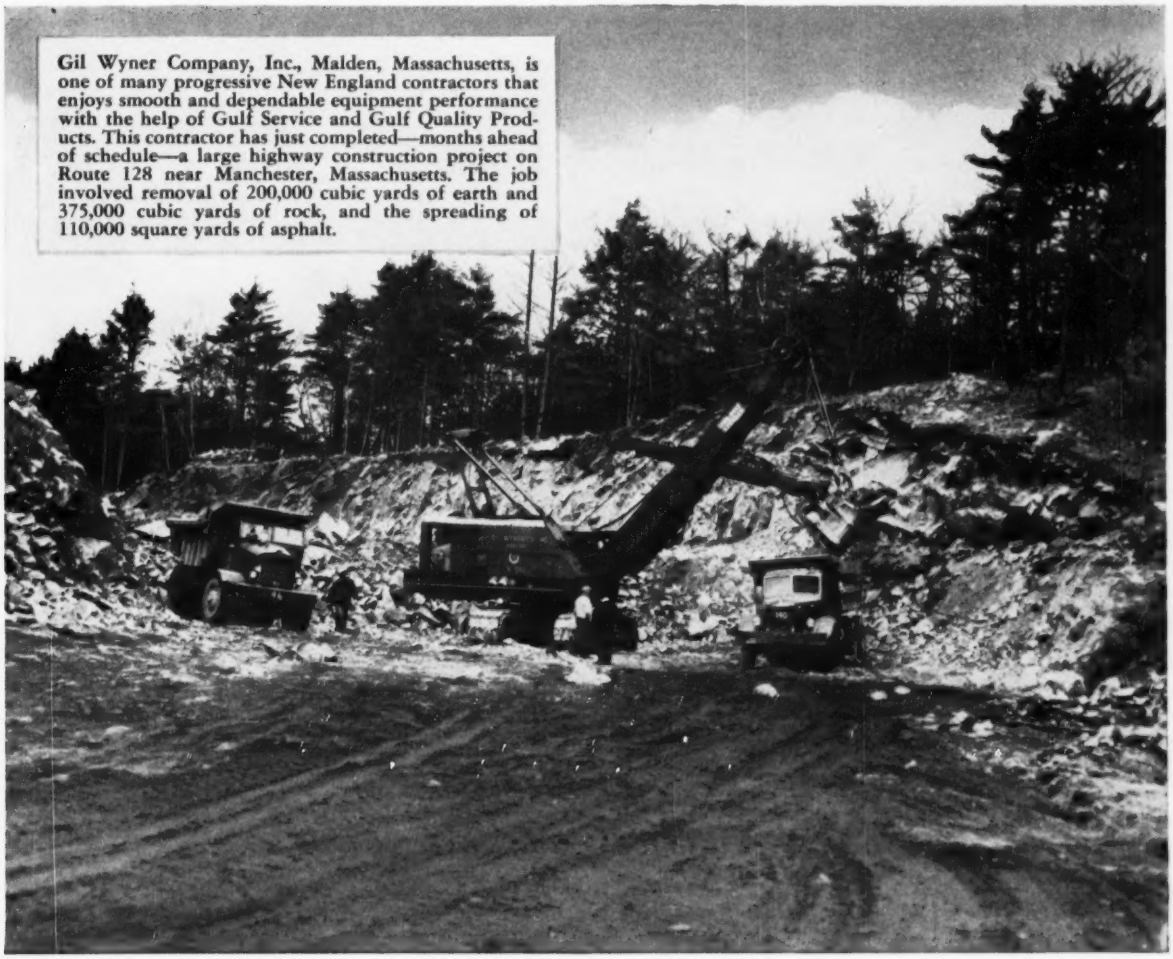
JOHNS MANVILLE JM PRODUCTS

Johns-Manville TRANSITE SEWER PIPE

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Massachusetts Highway Project



Gil Wyner Company, Inc., Malden, Massachusetts, is one of many progressive New England contractors that enjoys smooth and dependable equipment performance with the help of Gulf Service and Gulf Quality Products. This contractor has just completed—months ahead of schedule—a large highway construction project on Route 128 near Manchester, Massachusetts. The job involved removal of 200,000 cubic yards of earth and 375,000 cubic yards of rock, and the spreading of 110,000 square yards of asphalt.

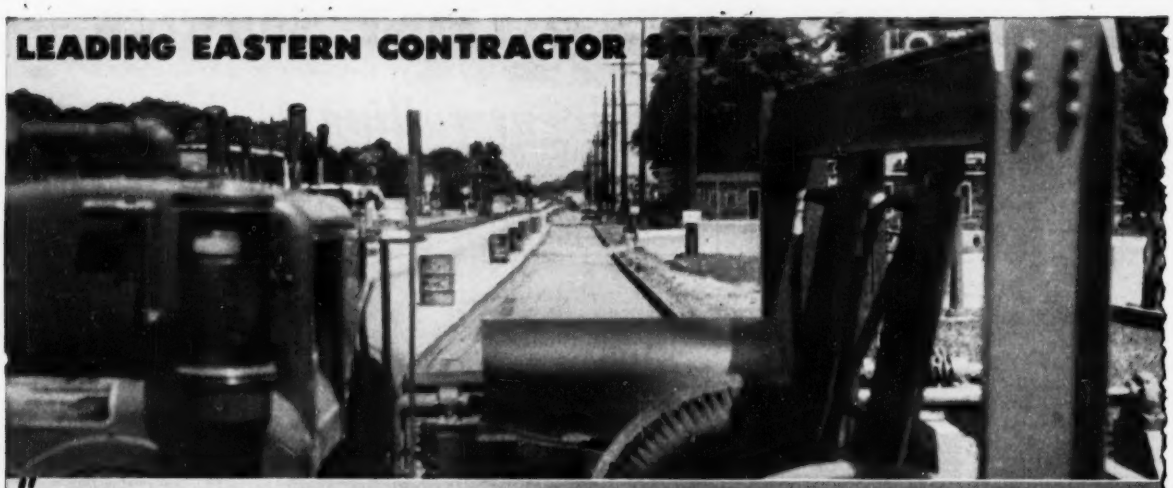
WITH higher-than-ever operating costs threatening every dollar of profit, it will pay you to take stock of the advantages of Gulf Service and Gulf Petroleum Products.

Advantages like these, for example: Quality lubricants that provide an extra margin of protection for every gear and bearing; fuels that insure full power for every engine; expert petroleum engineering counsel; and prompt delivery service. You'll find, as have so many leading contractors, that they all add up to fewer mechanical delays, lower maintenance costs, and an all-round smoother operation.

Let us discuss with you how our products and services can help you on your next job. They are available to you through more than 1400 warehouses in 31 states from Maine to New Mexico.

GULF

LEADING EASTERN CONTRACTOR



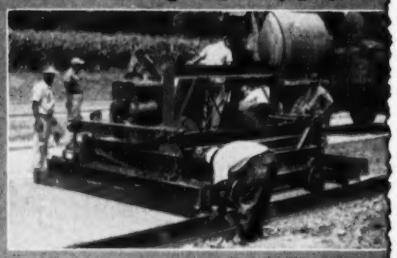
"Detroit Special Finishing Machine Ideal for Patch and Run Repair Operation on Route 1"

Flex-Plane's amazingly portable Detroit Special finishing machine, that is almost daily establishing production records in the slab finishing of streets, highways and airports, recently proved itself to be the ideal machine for the patch-and-run operation of road maintenance.

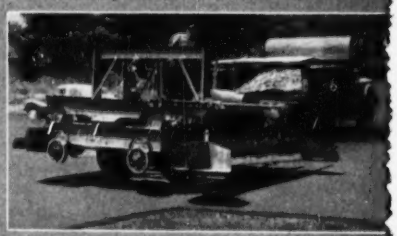
On an 18.2 mile stretch of popular Route 1, under traffic of 60,000 cars per day, the Utility Construction Company of New Brunswick, N. J. set one of the Detroit Specials to work on patches of 20-feet or over, and fast discovered that the mobility of the machine was quick to pay dividends.

The job called for intermittent full depth patching at irregular intervals and of various lengths. Utility believed the machine would permit them to do away with expensive hand finishing, especially on the longer stretches. After the first week Utility knew they were right. The Detroit Special not only gave them greater speed but developed a finish of uniformity and smoothness impossible to achieve through hand finishing.

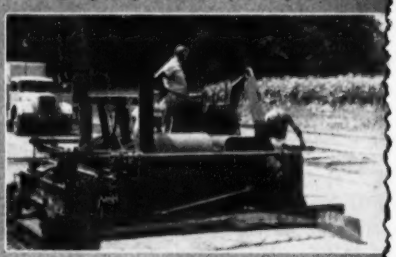
If you are in the business of concrete slab finishing, you should be acquainted with the Detroit Special, a machine that has sold itself to highway, municipal and airport engineers and contractors alike. Get the facts today. Write the **Flexible Road Joint Machine Co.**, Warren, Ohio, and ask for Bulletin **O-111.**



Finishing one section, Detroit Special . . .



is quickly and easily transported . . .

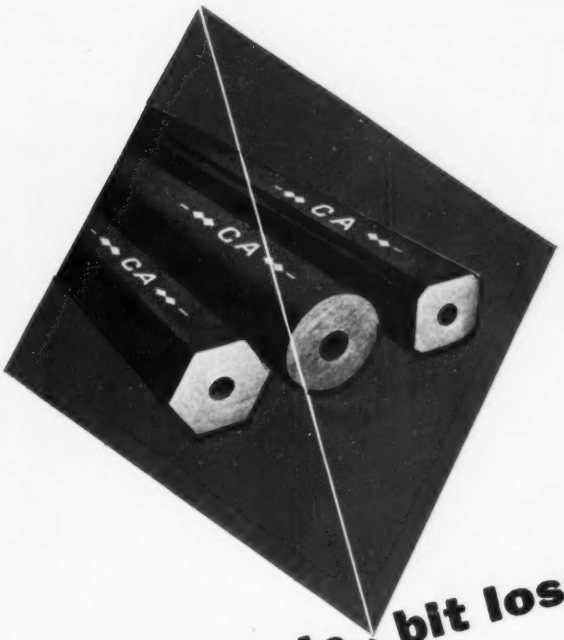


to second section a mile away.

The Flexible Road Joint Machine Company

WARREN, OHIO

CONSTRUCTION EQUIPMENT SINCE 1910

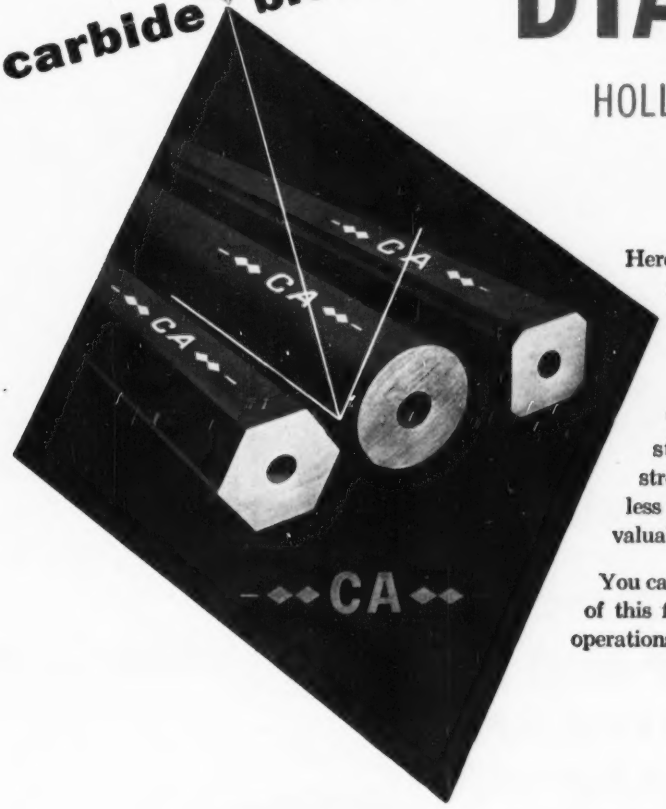


cut carbide bit losses

USE CRUCIBLE

DOUBLE DIAMOND

HOLLOW DRILL RODS



Here's the finest, toughest hollow drill rod made. Crucible DOUBLE DIAMOND is made to tool steel specifications by the nation's leading producer of tool steels.

That's why it has greater fatigue strength . . . and greater fatigue strength means lower drilling costs — less down time and fewer losses of those valuable tungsten, carbide bits.

You can't afford to overlook the advantages of this fine alloy drill rod in your drilling operations. Write for full details.

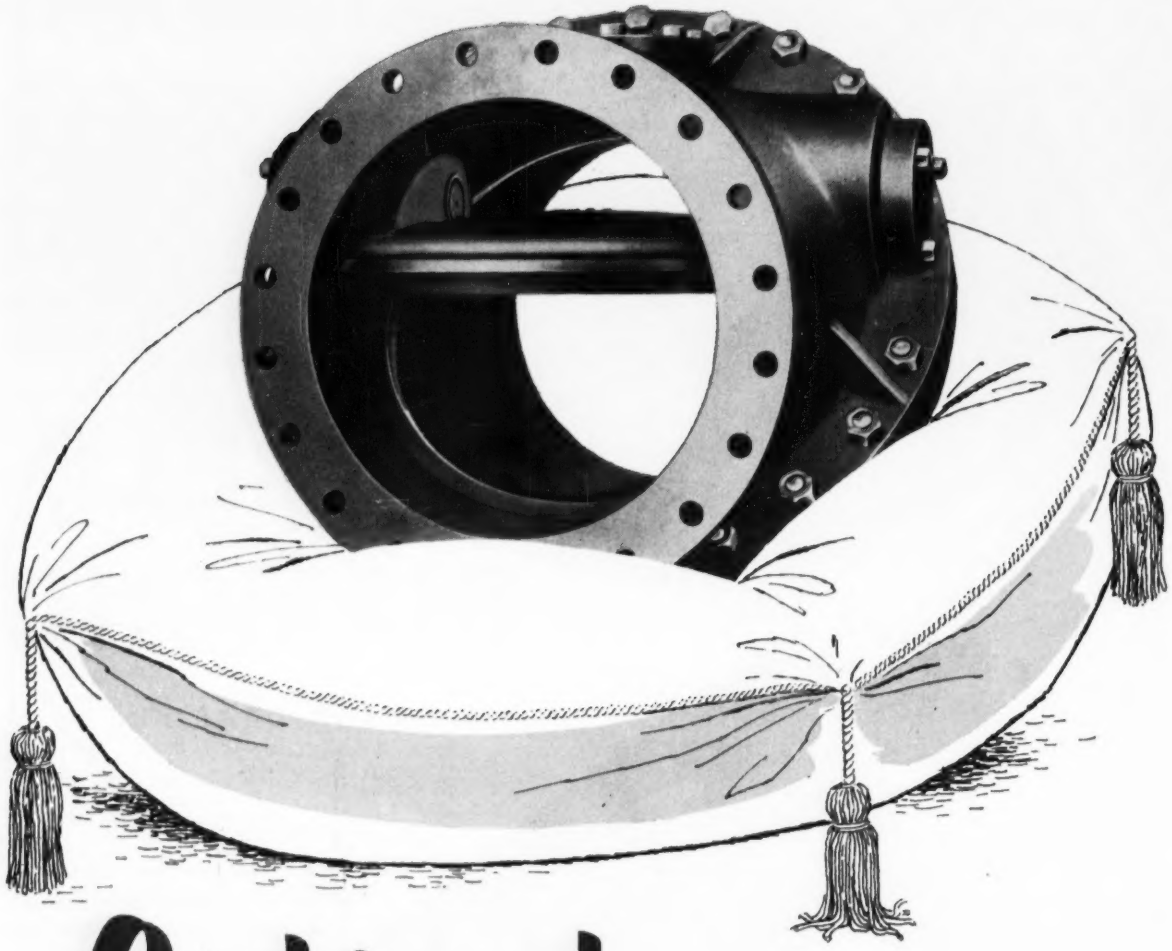
CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

HOLLOW DRILL RODS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



Cushioned

to a drop-tight seat...

... that's why these unique

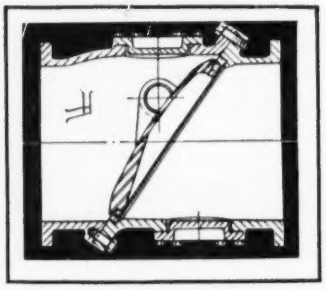
CHAPMAN

***Tilting Disc* CHECK VALVES**

cut head-loss to lowest levels

The Chapman Valve Mfg. Co.

INDIAN ORCHARD, MASSACHUSETTS



Here's what Chapman means by "Cushioning:"

This specially designed, "air-foil" disc balances perfectly in open position . . . then drops easily to closed position (cushioned by the flow). No jarring or slamming, in usual pipe-layouts. Write for bulletin.

CHAPMAN TILTING DISC **CHECK VALVES**

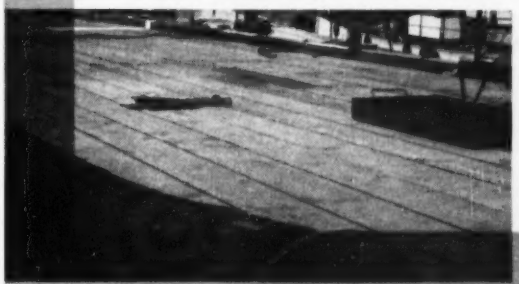
. Wood Treater: United Creosoting Company, Houston, Texas

THIS LOADING DOCK, built for the Warren Petroleum Corporation at Houston, was pressure-treated before construction with Monsanto Penta. Specifications called for a 6# net retention per cubic foot of wood. Penta offers protection against attack by rot, termites and other wood-boring insects.

Monsanto PENTA Adds New Life to Wood

Information for contractors. *Write for "Specify Penta." Complete facts and figures on penta applications. Ask also for list of treating plants in your area. Monsanto Chemical Company, Organic Chemicals Division, 800 No. Twelfth Blvd., St. Louis 1, Missouri.*

MORE THAN 60 TREATING PLANTS in the United States work with contractors to treat lumber to industrial specifications. Penta is used regularly by utilities, railroads, in heavy construction and in farm and home building. It leaves wood clean, easy to handle, paintable and also dimensionally stable if specified.



REPLACEMENT OF TIMBERS is expensive. New wood, penta-treated before use, will outlast untreated lumber 3 to 5 times.

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY... WHICH SERVES MANKIND

SERVICE PIN... for you, too

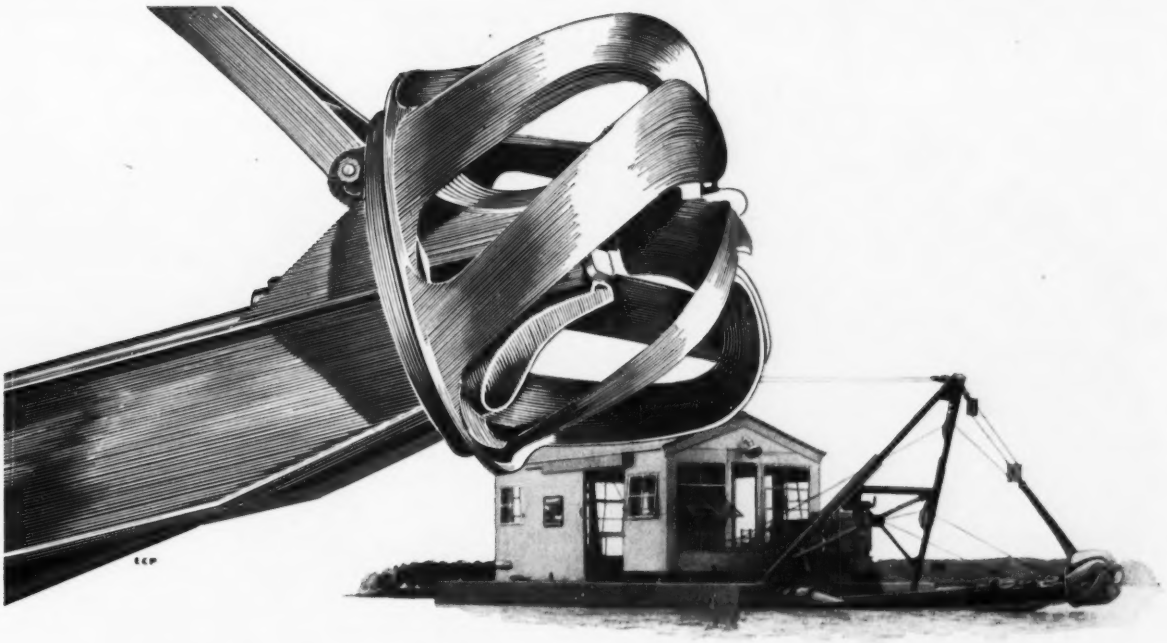
Chances are you've seen this pin. It represents 15 years of service with Socony-Vacuum. Six out of 10 of our engineers and salesmen wear it. Four out of 10 have served over 20 years. In fact, the average length of service of *all* Socony-Vacuum lubrication representatives calling on the construction industry is almost 17 years! All this petroleum engineering experience, the world's greatest, is yours when you call on Socony-Vacuum. Why accept anything less?

CORRECT LUBRICATION *for Contractors*

SOCONY-VACUUM

WORLD'S GREATEST LUBRICATION KNOWLEDGE AND ENGINEERING SERVICE

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL CO., INC., MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.



Put a Dragon's teeth to work on your

RESERVOIR · SETTLING BASIN · SWAMPLAND FLOOD CONTROL

● **Desilt . . . fill . . . reclaim land with portable Ellicott Dragon hydraulic pipe line dredge.** Newest of Ellicott dredge models—the Dragon performs one hundred and one dredging operations quickly, efficiently and at a minimum of cost. Dragon 8″, 10″ and 12″ models remove or deposit mud, silt, sand, etc., at rates up to 250 cubic yards per hour . . . to distances over 3000 feet.

The Dragon is portable—easily knocked down and transported by trailer-truck or flat car—and quickly re-assembled on land or water. The Dragon is versatile—a compact unit with every modern dredge feature, designed to operate in locations formerly inaccessible to dredges. It permits contractors, industries and municipalities to replace expensive and inefficient methods of excavation with hydraulic dredging—the cheapest known method of moving water-bound solids.

The development of the Dragon for greater mobility and efficiency in land-locked dredging is another example of how Ellicott is prepared to solve any dredge problem. For example, Ellicott will improve the performance of your old dredge, adapt it to a new job, or design, manufacture, deliver and service a new dredge tailored to your specific needs.

* * *

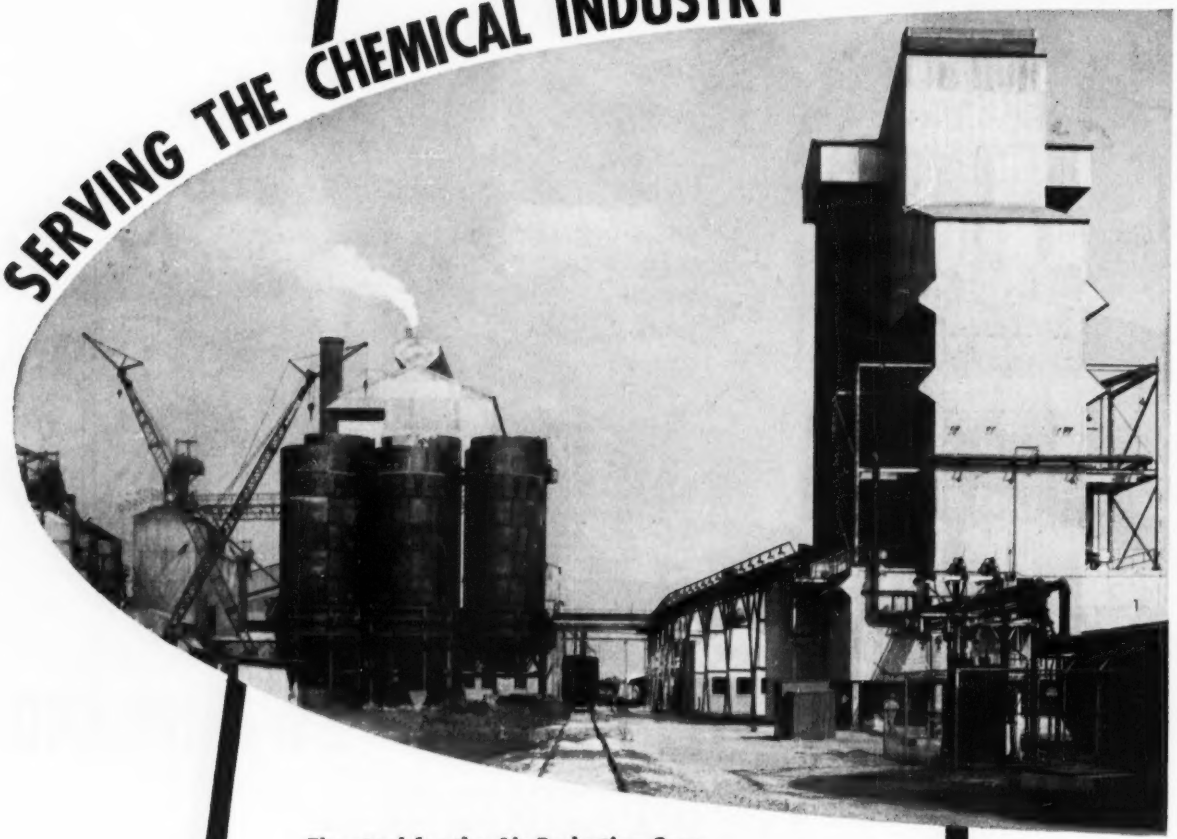
For more information about the Dragons and other Ellicott dredging services, write for free illustrated catalog 826, to:

ELLICOTT MACHINE CORPORATION
1603 Bush St., Baltimore 30, Md.

ELLICOTT DREDGES

This Dragon 8 removes silt accumulation from a large irrigation canal

SERVING THE CHEMICAL INDUSTRY



The steel for the Air Reduction Company's new calcium carbide plant at Calvert City, Kentucky, was fabricated and erected by Ingalls with United Engineers and Constructors, Inc. as the engineers.

Whatever fabricating problem is confronting you . . . if it's structural steel or plate work, Ingalls can fabricate it.

Fabricating Steel is Our Business

THE INGALLS IRON WORKS COMPANY
BIRMINGHAM, ALABAMA

Sales Offices: New York, Chicago, Pittsburgh and Houston
Plants: Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Pascagoula, Miss., Decatur, Ala.

READER COMMENT

Credit for price data

SIR: The San Francisco District, Corps of Engineers, is flattered by the recognition given us in the Oct. 8 issue of ENGINEERING NEWS-RECORD, and I, personally, take this opportunity of expressing my appreciation and that of my staff.

The compilation of our "Contract Unit Prices" data is of course dependent for accuracy on our source of factual information. This information is supplied to our office by the Daily Construction Service, published by the Wade Publishing Co. in San Francisco. Their daily publication, containing the abstracts of bids, is vital to our part of the work, and it is only fair for me to suggest that the Daily Construction Service is entitled to share the recognition that you have given the Corps of Engineers.

GEO. H. WALKER
Colonel, Corps of Engineers
District Engineer
San Francisco, Calif.

Job finished

In its issue of July 30, ENGINEERING NEWS-RECORD commented that the Dravo Corp. of Pittsburgh was then engaged (with a number of others) on a project to extend electric power and telephone facilities in the area of Sao Paulo and Rio de Janeiro for the Brazilian Traction, Light and Power Company, Ltd. Dravo officials have informed us that their company is no longer carrying on any work in Brazil.

CALENDAR

Engineering Institute (construction costs and planning) University of Wisconsin, Madison, Dec. 7-8.

Annual Highway Conference, Maine Section, American Society of Civil Engineers, University of Maine, Orono, Dec. 18-19.

American Road Builders Association, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., Jan. 5-7.

National Constructors Association, annual meeting, Hotel Commodore, N. Y. City, Jan. 12-14.

Highway Research Board, annual meeting, National Academy of Sciences Building, Washington, D. C., Jan. 12-15.

National Association of Home Builders, annual convention and exposition, Conrad Hilton and Sherman hotels, Chicago, Jan. 17-21.

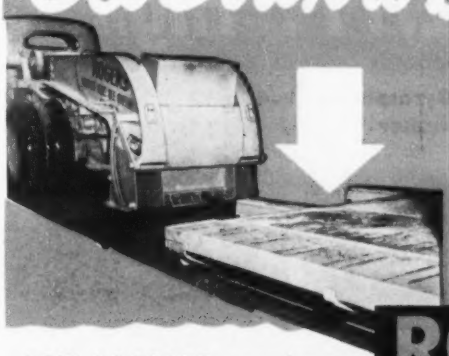
Land surveyors conference and exhibition, University Commons, Rutgers University, New Brunswick, N. J., Jan. 23.

Mason Contractors Association of America, Sherman Hotel, Chicago, Jan. 24-27.

Conference on Prestressed Concrete, University of Toronto, Toronto, Ont., Jan. 28-29.

Associated Equipment Distributors, Waldorf Astoria Hotel, N. Y. City, Jan. 31-Feb. 4.

"Get Down to Business"



TO A LOW LOADING DECK HEIGHT OF ONLY 16" WITH THE VERSATILE TYPE "TPG"...

ROGERS POWER LIFT DETACHABLE GOOSENECK TRAILER

PATENTS PENDING

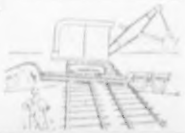
LOW LOADING permits an easier, faster, more profitable operation in hauling equipment to and from the job.

Shovel "walks" up low deck over a minimum of blocking and rampage. *There is no stress or strain applied to the frame or gooseneck.* No blocking required under frame.

For your best buy in a multi-purpose, heavy duty trailer, investigate this versatile unit. It incorporates every desirable "job-proved" feature originated by Rogers.

CAPACITIES: 15, 20, 25, 30, 35, 40, 50, 60 & 75 TONS

DETACHES, LOADS AND ATTACHES IN 5 MINUTES — LOADS EASILY OVER LOW FRONT OF DECK — RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS — STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS — 20" & 24" TIRES INSURE GREATER TIRE LIFE, LARGER AND MORE EFFECTIVE BRAKES: AND OFTEN PERMIT INTERCHANGEABILITY WITH TRACTOR TIRES.



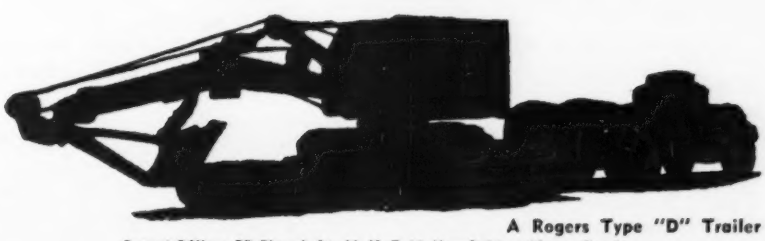
THE ROGERS Power Lift DETACHABLE GOOSENECK CAN BE OBTAINED ON ANY STANDARD ROGERS DROP DECK TRAILER

Write for the LATEST CATALOG

EXPERIENCE builds 'em — PERFORMANCE sells 'em

ROGERS BROS. CORP.

ALBION, PENNA. CABLE: BROSITES



A Rogers Type "D" Trailer

Export Office: 50 Church St., N. Y. 7, N. Y.—Cable address: Brosites

FLEXIBILITY! High Production!

10″ x 30″ Jaw Crusher | 36-S Gyrasphere Crusher | 4′ x 12′ Vibro-King Screens | 20″ x 15′ Sand Classifier | 36″ x 25′ Sand Drag

4′ x 10′ two-deck Scalper Screen

Tri-County Gravel Co.
Sandyville, Ohio

24″ x 91′ Stacker Conveyor

Producing Specification Aggregate with TELSMITH

24″ x 5′ Standard Plate Feeder

Mr. I. J. LeBold, experienced and successful Ohio aggregate producer, recently purchased this Telsmith Engineered and Equipped Plant. It economically processes 100-125 tons per hour of sand and gravel to meet Ohio State Highway Specifications. Three sizes of gravel, two sizes of sand and a minus ¾″ road gravel are produced with only minor adjustments and, in cold weather, the plant can be changed from a washing application to a dry road gravel plant by flipping one gate. Get all-Telsmith plant story in Bulletin 266.

G-22

SMITH ENGINEERING WORKS, 500 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Easyworks, Milwaukee

11 East 42nd St., New York 17, N. Y. · 211 W. Wacker Drive, Chicago 6, Ill. · 712 Commercial Trust Bldg., Philadelphia 2, Pa. · 209 Main Street, Cambridge 42, Mass. · Bucket Equipment Co., Milwaukee 3, Wis. · The Meloon Co., 3535 Lakeside Ave., Cleveland 14, Ohio

Stanton Equipment Co., Rochester, Mich. · Rich Equipment Co., Cincinnati 14, & Portsmouth, O.—Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 19, Va.

Robert H. Bailey, 816 W. 5th St., Los Angeles 17, Calif. · Minor Equipment & Equipment Co., San Francisco 4, Calif. · Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash.

IN THIS ISSUE

November 26, 1953 Vol. 151, No. 22

NATIONAL AFFAIRS

Federal highway aid continues to hold congressional support 21
Decision on Missouri River diversion project favors dam instead of pumping plant 21
Engineers report on Scarsdale building collapse 22
Modifications of traveling scaffolds to follow Golden Gate Bridge accident 23
Lining of Tecolote Tunnel to heading is planned to overcome intense heat 25
New York Coliseum project gets under way 25
Factory illuminated by new-type lamps 26
Chicago bids for engineering societies' headquarters 26

LABOR

Construction trends 28
Regional pacts on rise in Washington, Oregon 28

FEATURES

3-story prestressed building is tallest in U. S. 31
What killed the carp in the Kalamazoo? 37
Automatic welding goes into the field to assemble tunnel-lining sections 39
Steel lamella supports long-span roof 41
Improved lock gate design reduces filling turbulence 42

MUNICIPAL

St. Paul launches decade of public construction 45
Aluminum posts reduce costs 46
City power dams cleared by second court decision ... 46
Park-O-Mat claims success after 22 months in operation 47

MEN AND JOBS

Henry Soper: His small-scale models solve big problems for power plants 48

INTERNATIONAL

Reinforced concrete building houses Brazilian newspaper and hotel 53

BUSINESS AND FINANCE

Government predicts 2% dip in 1954 construction volume 61
Money may tighten—but trend won't last long, say bond market men 62
"Operation Facelift" starts in Los Angeles 62
Texas group buys control of Pigeon Hole Parking 63
Proposed work picks up fast in first half of November 63

NEW PRODUCTS

New portable crushing plant boasts high production rate 77
Combination instrument figures the angles 78
Weight is reduced on load transfer assembly 80
Three-way dumping hoist eliminates truck jockeying 81
Tape forms calking handles more easily 81
Publications 82

Reader Comment 15
Calendar 15
Washington Observer .. 19
Weather 36
Obituaries 54
Construction Reports ... 55
Unit Prices 59
Editorials 84

THE CONSTRUCTION WEEK

- **For the good of the order**—Backed by professional groups, two states put teeth into moves to enforce professional licensing laws:

  The Arkansas State Board of Registration for Professional Engineers hired an attorney for the special purpose of prosecuting violators of the state's year-old professional registration law—which provides fines up to $200 for each offense, and up to three months' imprisonment for violations.

  And California's boards of registration for civil engineers and architects sent out a stern letter to all their licensees, warning particularly that the cursory examination by a licensed engineer of a set of plans prepared by someone else may be a violation of existing law.

  The California engineer examining body had a case in mind: Where a Los Angeles contractor appeared (in April, 1951) at the city building department for a permit to build a swimming pool. The department wouldn't accept the plans without a licensed engineer's signature—which the contractor obtained within a half hour. "It was obvious," said the board, "that the engineer hadn't studied the plans." (The engineer was suspended for 15 days).

- **Question of responsibility**—And architects in Florida also had another problem with which to cope:

  The State Board of Public Instruction directed its attorney to draft all future architect contracts so as to fix responsibility on architects for any extra school construction costs resulting from failure to show all necessary details in the working drawings. The board directed also that agreements with architects be rescinded if they refuse to accept contracts with such clauses in them.

- **Private enterprise note**—Soviet Russia—through the medium of a report published in the official newspaper, Izvestia—has announced that its building organizations are for the first time accepting orders from private purchasers for construction of standard houses.

  A much wider sale of several types of houses is planned in larger cities next year, said the government organ.

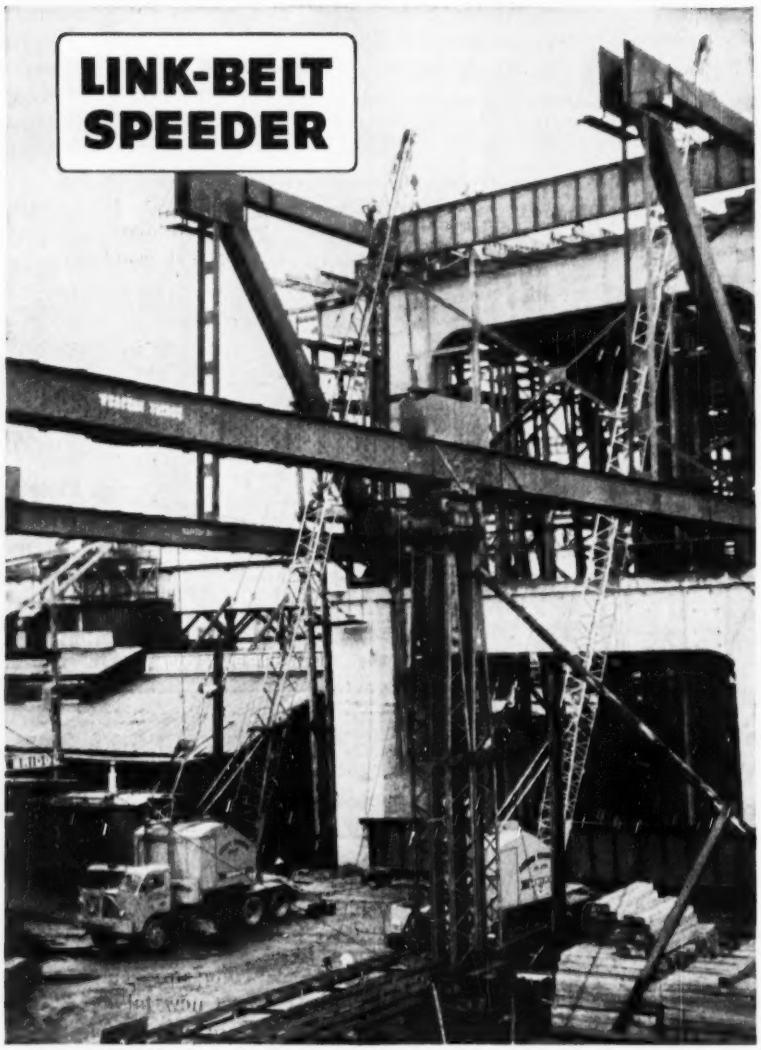
- **Master transit plan**—The nine heavily populated counties around San Francisco Bay will get a new blueprint of what can be done about rapid transit within two years, under terms of that engineering contract awarded to Parsons, Brinckerhoff, Hall & Macdonald, New York consultants.

  Operating within a $600,000 state-county fund, the engineers are commissioned to prepare a general plan of regional development, origin-destination traffic studies, prepare an overall transit plan, study economic and physical aspects of private and mass transportation, and methods of financing construction of facilities.

  A separate study will be made of rapid transit financing.

Before you buy a Truck-Crane:

Check safety, mobility!



These two HC-90's, with 80-ft. booms, speed a steel erection job in Vancouver, B.C. At times, one of the rigs is equipped with a 90-ft. boom and a 20-ft. jib.

Patented Retractable Gantry is raised or lowered under power in minutes. Raised gantry decreases load on boom, hoist cable and mechanism . . . results in safer operation.

Link-Belt Speeder HC-51 and HC-90 Truck-Crane designs assure more work per shift, greater earnings per job

TAKE the HC-90 for example: here's a 25-ton capacity rig that has upper machinery specifically engineered to match its extra lifting capacity.

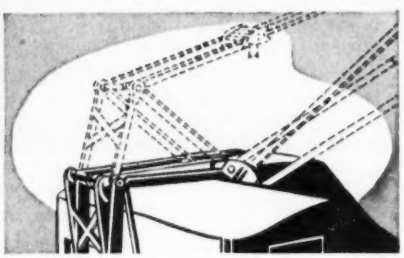
While this special design increases performance and stability, it's only one of the many advantages you get with a Link-Belt Speeder. In addition to rugged all-welded construction and heavy-duty components throughout, there are features such as: patented retractable gantry, hook-type conical shaped rotating rollers and pin-connected hinge-type boom.

Then, too, with ten speeds forward and positive drive to four full-floating rear wheels plus removable rear outriggers, the fully convertible HC-90 travels and works almost anywhere. It's this quick mobility that helps turn small, scattered assignments into real profit-makers.

For details on the 25-ton capacity HC-90, see your distributor or write for catalog 2350. For facts on the 12½-ton capacity HC-51, ask for catalog 2428.

LINK-BELT SPEEDER CORPORATION
Cedar Rapids, Iowa

13,304



LINK-BELT SPEEDER
CORPORATION
BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

FACTORY-TRAINED DISTRIBUTOR SALES AND SERVICE SPECIALISTS ...*EVERYWHERE*

WASHINGTON OBSERVER

Recommendations for a new federal housing policy will go to Eisenhower by mid-December. Housing Administrator Cole has asked the Presidential committee on housing policies and programs to wrap up its work at a three-day meeting next week. Its findings will be on the President's desk when he confers Dec. 17-19 with congressional leaders on next year's legislative program and his state of the union address.

Decisions on credit, insurance and public housing will be made on the basis of the committee's work. The committee members have been close-mouthed on the direction their investigations are going. But this much is known: FHA Commissioner Hollyday wants higher loan insurance on existing homes and credit aids for slum rehabilitation.

•

New kink in hydraulic engineering is being tried by Bonneville Power Administration and the aluminum companies which use BPA power. It involves using water that ordinarily wouldn't be used on the gamble that next year's rainfall will make it up.

Idea is to draw on cyclical storage behind Hungry Horse Dam to firm up power for the aluminum companies right now. The companies have guaranteed to supply an equal amount of power if it's needed next year because of low runoffs. Either the companies will cut back their own power consumption to keep other customers fully supplied—or they'll buy high-priced steam power outside and feed it into the BPA system.

•

Army Engineers Board this week okayed $2,068,500 as government's share of an $8,366,000 drainage and flood-control project in Ft. Bend County, Tex. Recommendation must now be submitted to Congress.

Harold F. Holtz of Lincoln, Neb., is new special assistant in the Department of Defense office of real property management.

•

Court speed-up on St. Lawrence power project is designed to get a final decision out of the Supreme Court before next June. Court of Appeals in Washington will hear arguments December 23 from opponents of the power project. Without the speed-up, the case would not have been heard until later—too late for a decision to go to the Supreme Court this term.

Speed-up will enable construction to get under way next year according to government officials who argued for it.

•

Tug-of-war over new cuts in the defense budget is building up. The budget-cutters—led by Secretary of Treasury Humphrey—now have a new talking point. The country needs some bigger tax reductions than heretofore planned—and that can only be done by putting through another big slice in Defense Department spending.

Wilson will fight any big cut-back in spending by his department. The talk has been that Defense could contribute say $4.5 billion of an additional $6-billion cut in federal spending next year.

•

Taft-Hartley's closed shop ban has been tightened again to thwart tacit agreements between contractors and unions on hiring workers. The U. S. Court of Appeals in Denver has upheld an NLRB interpretation that a "tacit" agreement to hire only union members is just as illegal as a written contract. The decision went against Construction Specialties Co., Denver, and the AFL asbestos workers. Two workers the company would not hire because the union wouldn't clear them are to get back wages.

BORDEN MANUFACTURES EVERY TYPE FLOOR GRATING

IN FERROUS AND NON-FERROUS METALS

BORDEN ALL-WELD DESIGN

The best type for use where floors are subject to extreme corrosion or moisture — chemical plants, breweries and other process industries. There are no cracks, open joints, or holes in bars. This type made only in mild steel.

BORDEN RIVETED DESIGN

Most substantial and oldest design of grating made, permits perfect distribution of loads. Made on the truss principle, Borden Riveted Gratings are hydraulically power-forged for strength and durability. Particularly recommended for aluminum.

BORDEN PRESSURE LOCKED DESIGN

Neat, clean, durable, easy to paint and maintain. Pressure Locked Design permits maximum passage of light, heat and air. It is especially desirable in power plants, boiler rooms and all dry area. Deep cross bars increase lateral support.

SEND FOR FREE CATALOG COVERING ALL FLOOR GRATINGS

BORDEN METAL PRODUCTS COMPANY

815 GREEN LANE Elizabeth 2-6410 ELIZABETH, N. J.

SOUTHERN PLANT -- LEEDS, ALA. — MAIN PLANT—UNION, N. J.

Federal highway aid continues to hold congressional support

Agitation for scrapping program apparently is failing to carry much weight; even bigger allotments likely

The upcoming second session of the 83rd Congress will lose little time in getting down to business on a federal-aid highway bill for fiscal years 1956 and 1957.

Signs both inside and outside of Congress point to continuance of the present program, with increased money allotments for federal aid to the states. The forces calling for withdrawal of federal aid and federal supervision on selected highway systems seem due to meet more than their match when Congress convenes.

Moral obligations to the states under long standing federal-aid policy permit no postponement of a decision by Congress. The legislatures of the states must know what the federal government is going to do before they meet in January 1955 to pass on their own highway budgets.

• **Presidential commissions**—President Eisenhower's two commissions—the Hoover group analyzing federal functions plus organization and the Manion committee studying fiscal relations of the states and the federal government—will both delve deeply into the highway controversy. The Hoover Commission's final report isn't due until the spring of 1955; the Manion group—concerned with taxes rather than with functions such as federal highway aid—is to report its recommendations by March 1, 1954.

Findings of the Manion Commission could have an effect on the debate over next year's highway bill—particularly if the commission goes along with the demand of state governors that the federal government get out of gasoline taxation completely and leave that tax source entirely to the states. That course—if recommended—would run into almost insurmountable obstacles in Congress.

First of all, neither Congress nor the Administration would want to cut off another billion dollars of tax income in a year when other tax revenues are being decreased some $8 billion by law. Such action wouldn't match up with the Republican effort to get nearer to a balanced budget. And, second, killing the federal gasoline tax wouldn't fit well with congressional desires to increase federal aid and thus speed the improvement of the nation's highways.

• **Congressional attitudes**—Congressional thinking on both points came to the surface at the recent annual meeting of the American Association of State Highway Officials (ENR, Nov. 19, p. 25). Among House and Senate committee leaders at that meeting—the men who will have most to do with next year's highway bill—the ratio was three-to-one in favor of continued federal aid and continued gasoline taxation.

On the basis of past congressional records and public statements, a similar but somewhat smaller majority in favor of the existing program can be found among the members of the public works committees—and among the full membership—of both houses. The attitude of Congress points strongly to a bigger highway bill than the one enacted in 1952 for fiscal years 1954 and 1955. That measure provides $575 million a year in federal aid.

The Administration's stand may not become publicly known until the President sends his budget message to Congress in January. That message would be the logical place for Eisenhower to advise Congress on highway commitments for fiscal 1956 and 1957.

• **Commerce Dept. stand**—What the President recommends will be determined largely by the Commerce Dept. and the Budget Bureau, with Eisenhower having the final word. Commerce Secretary Weeks, Undersecretary for Transportation Robert B. Murray and Public Roads Commissioner Francis V. du Pont have to set the Commerce line in the tug-of-war.

If du Pont's views prevail, there is little doubt that Commerce will fight for continuance of the federal-aid program, with some modifications aimed at improving it. Should Murray win the Commerce argument, sharp curtailments will be recommended. The final decision will be up to Weeks, and that decision then will have to get Budget approval.

But Congress is likely to go its own way, no matter what the Executive Branch recommends. Passing a big federal-aid bill will be easier all around if Commerce, Public Roads and the Budget Bureau support it. Congress, however, probably will push such a bill through to enactment even if the executive agencies are barred from speaking in favor of it.

It is doubtful that the bill can be as big as the AASHO voted to ask for—a total of $900 million a year in federal aid, with $250 million of it going to the interstate system on a 75-25 matching basis instead of the traditional 50-50 ratio of federal-state payments. But congressmen promise some surprises when the bill comes up. The outcome may be nearer the AASHO figures than hardened observers expect.

Decision on Missouri River diversion project favors dam over pumping plant

Missouri River diversion below Fort Peck Dam in Montana can be better accomplished by building a dam than by installing a pumping plant. This was the decision made last week by Interior Secretary Douglas McKay on the advice of a special board of consultants (ENR Sept. 24, p. 26).

Reclamation Commissioner Wilbur A. Dexheimer moved fast to get the job started. Bids will be asked as soon a specifications can be completed, with the aim of starting work next spring on the initial development, including the dam at the Porcupine Creek site, 22 mi downstream from Fort Peck Dam.

This portion of the project, comprising the diversion dam and a 32-mi canal to supply water to some 7,200 acres on the south side of the river, will cost an estimated $11.7 million. The total project, known as the Missouri Diversion Unit, will carry water to 100,000 acres of northeastern Montana land. Estimated total construction cost exceeds $54 million.

Reclamation has about $300,000 in hand to start construction and another

(*Continued on page 22*)

Engineers report on possible causes of building failure at Scarsdale, N.Y.

Light was shed last week on the nature of the design and construction defects that might have caused the collapse on July 10 of a portion of a four-story reinforced concrete building in Scarsdale, N. Y., in which three workmen were killed and ten others injured. The illuminating information was contained in a report filed with the Village Board by its consulting engineers, Seelye, Stevenson, Value & Knecht, of New York City.

The consultants concluded that "the factors which contributed, or could have contributed, to the collapse . . . included low-strength concrete, steel reinforcement missing or misplaced, and exterior columns, as designed, being weak in resistance to bending. In addition to these factors, there is a further one—the possible lack of adequate reshores."

(Editor's note—This report became available after the editorial on p. 84 went to press. When it was written, there were indications that the reports of the various consultants who investigated this disaster would not be disclosed. Consequently, the editorial was limited to a discussion of the requirements of the type of construction used for this building and the danger of not fully satisfying them. The report further emphasizes this danger.)

The structure was to have been a four-story office building and a six-story apartment house of flat-plate construction. Concrete was being placed for the fourth floor of the office building when one corner collapsed (ENR July 16, p. 26).

A grand jury investigating the accident reported that it was unable to determine the cause or to conclude that any individuals were guilty of criminal negligence (ENR Nov. 19, p. 26). However, its presentment charged that there existed defects in design, material and construction that might have caused or contributed to the collapse. It did not enumerate these.

• **Concrete tests cited**—The report filed by the Village Board consultants, though, does indicate what the defects referred to might have been.

"The strength of the concrete as shown by the cores which we have taken from complete slabs," it charges, "is, in many cases, so low as to indicate an unsatisfactory condition, inasmuch as the design stresses in some cases exceed the strength of the concrete cores. . . . The core samples showed, in most cases, quite different results from those of the sample cylinders which were taken at the time each section was poured and tested by the testing laboratory."

Cracks were observed in the exterior columns, which the investigators believe indicate an overstress in these members.

• **Cracks traced to steel omission**—The engineers also noted the omission of steel from shop drawings for some slabs and found cracks in the corresponding areas, leading to the assumption that the steel was omitted in the field as well.

"The most serious condition occurs at several locations in the form of severe cracks extending across several floor panels at about one-quarter the distance between columns. Such cracks immediately create the suspicion that there is a place where it is possible to draw a line from top to bottom through the slab without intercepting any steel. Where such is the case, unreinforced concrete is in tension, a condition which should never be permitted in reinforced concrete design and construction.

"To verify these conditions, ten of these cracks were opened up . . . in one case, the top steel was present but was set low. In two cases, there was no top steel. In three cuts, 7, 10 and 22 in. wide, entirely through the slabs, no steel was encountered, and near the last cut, top steel was found but was set low.

"In a 9-in. cut, the top and bottom steel lacked 2¼ in. of meeting at the crack. One cut, 18 in. wide, encountered no steel, and further chipping found top steel 3 in. short of the crack and 4 in. down from the top, instead of 1¼ in. to the center line. In another case, the top and bottom steel extended to the crack but did not lap . . ."

• **Reshoring is questioned**—An investigation of the reshoring used on the job adjacent to the collapsed area showed it to be sparse and of poor quality, the engineers reported. Several posts were found out of plumb. Many were short and the deficient length made up of wood blocking. In addition, the reshores were placed under only one story below the pour, instead of two as is often done.

"One conclusion," the report continues, "is that had the reshores been ample and sound, the collapse might not have occurred, even in the presence of various combinations of the other factors mentioned above. However, had these other elements of weakness not been present, or had they occurred in sufficiently isolated form, it is also possible that the collapse would not have occurred, even with the amount of reshoring probably used."

Frank J. Heller, of Scarsdale, owner of the property, is reported to have told the Village Board that 75% of the structure already built would be demolished—leaving only the lower portion.

To prevent similar disasters in the future, the consulting engineers included in their report a recommendation that the local building code be amended to preclude the common practice, which was followed on the ill-fated building, of employing an architect and structural engineer to make plans but not to do the field inspection. This also was recommended by the grand jury.

. . . Missouri River diversion project favors dam

$1.4 million of appropriated money that can be used as soon as the Budget Bureau releases it. The latter fund was impounded by the bureau after the appropriations committees of Congress directed that construction be held up until the Interior Secretary made a decision on the dam vs. pumping question.

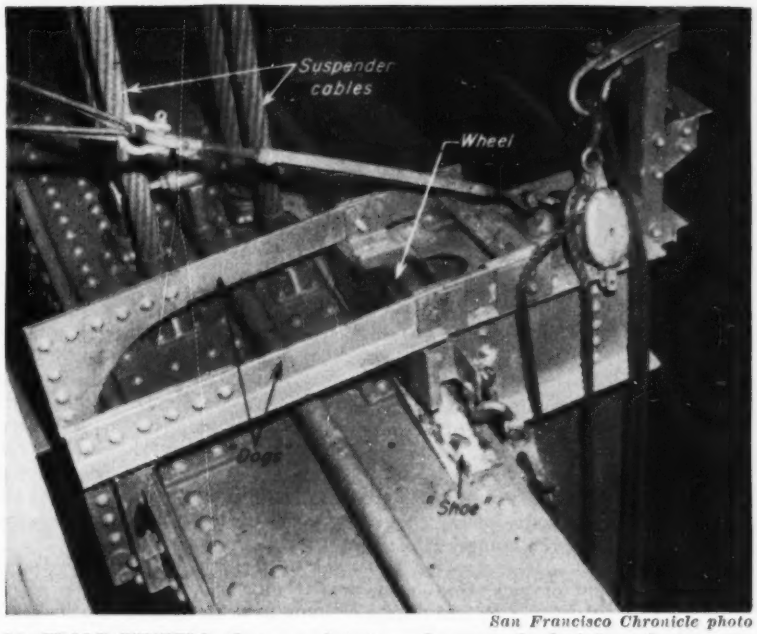
Hydro power production is possible at the dam, but the Reclamation Bureau will install only penstocks and other basic equipment. Reason: The Senate Appropriations Committee directed that no generating facilities be installed without specific allocation by Congress of funds for that purpose.

It was the hazards of an unpredictable river that tilted the decision in favor of the diversion dam.

But the vagaries and heavy siltation of the river impose serious risks on future maintenance and operation costs of a pumping installation.

A saving of $10 million could have been made in the total cost of the Missouri Diversion Unit if the pumping plant had proved the better bet, reducing the estimated construction bill to something over $44 million. However, estimated yearly costs for operation and maintenance would be $76,000 higher—$430,000 a year for pumping as compared with $354,000 for diverting water by means of the dam.

The board consisted of John S. Longwell, consulting engineer of Piedmont, Calif.; Ralph Lowry of San Mateo, Calif., former chief construction engineer of the Bureau of Reclamation, and William F. Uhl, president of Charles T. Main, Inc. of Boston, Mass.



San Francisco Chronicle photo

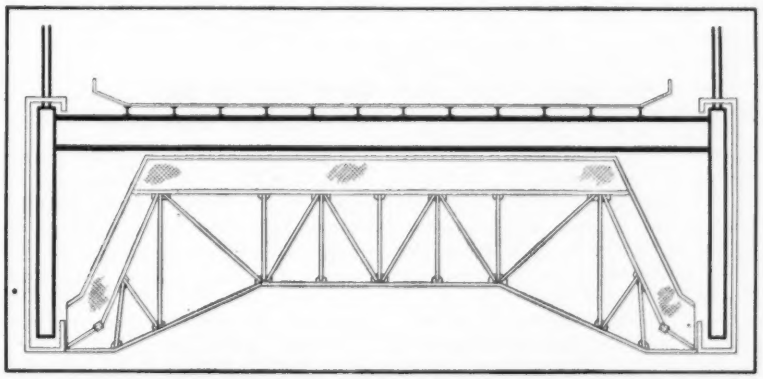
SCAFFOLD WHEELS ride a row of rivets on the upper chord of the stiffening truss. At suspender cables, wheels are rolled up on a "shoe" to permit smooth travel over a splice plate. And a safety arm that hooks over the inner edge of the beam is released. It was during this movement that the accident occurred. A turnbuckle holds the scaffold between movements. Rope and sheave have nothing to do with scaffold movement.

Modifications of traveling scaffolds to follow Golden Gate Bridge accident

California's Division of Industrial Safety has ordered modifications of the three remaining traveling scaffolds on the Golden Gate Bridge as a result of the recent accident that killed two Judson Pacific-Murphy Corp. steelworkers (ENR Nov. 12, p. 23).

The scaffolds originally were intended for maintenance work. When modified, they can be used only for the present construction program of adding a bottom lateral system to the bridge-deck stiffening structure, which will provide greater resistance to wind-induced movement. The new structural members, when installed, will interfere with the scaffolds and require their dismantlement.

Existing scaffolds have no rails for their wheels and the wheels are grooved rather than flanged. They roll along the outer edge of a 3-ft-deep beam—the top chord of the stiffening truss—straddling a row of rivets.



TRAVELING SCAFFOLD on Golden Gate Bridge side span is identical with center span scaffold that failed in Nov. 6 accident. Note that the entire assembly rides on the top chord of the stiffening truss and is free of the bridge except at that point.

Here's what the modification order specifies:

- Provide some means of restraining the four wheels of each scaffold inwardly during movement.
- Modify the "shoe" devices that permit the wheels to ride over splices in the girder chords so that the shoes are firmly fastened to the bridge and so that they have some ridge or flange to engage the wheels.
- Institute some systematic procedure for moving the scaffolds and include safety belts and tag lines for all workmen.

Meanwhile, other investigations are under way to attempt to determine the cause of the accident. The contractor, for example, has had X-ray studies made of essential parts of the remaining scaffold.

Killed in the accident were Donald V. Hogan and Albert M. Croxson, who fell when one of the 15-year-old maintenance scaffolds failed. These scaffolds were not included in the original bridge design but were added later.

Judson Pacific-Murphy was using the existing scaffolds to back out the necessary rivets to provide the connecting framing for the new bottom lateral system. Since the new work will convert the bridge-deck stiffening system from an inverted U-shape to a box shape, the old scaffolds will no longer be usable. Actual erection of the new steel will be accomplished in part by use of a conventional type, safety net-equipped traveler moving inside that part of the box framework that has been completed at the present time.

Three states join in traffic survey

A survey will be made of the added traffic burden that will be imposed on Virginia and North Carolina by West Virginia's 88-mi Charleston-Princeton toll highway which is scheduled to be completed some time early next fall.

Highway officials of the three states, meeting in White Sulphur Springs, W. Va., last week, authorized the New York firm of Coverdale & Colpitts to make the survey and report by Jan. 1. The three-state highway committee is scheduled to meet again Feb. 8.

The study is to determine the future highway needs along a north-south route that would run through three southwest Virginia counties. Virginia authorities already are studying the feasibility of a turnpike that would connect with the Princeton end of the West Virginia toll road and then be extended into North Carolina.

Water gamble

Storage at Hungry Horse Dam to be tapped to aid aluminum companies

Industry and the Bonneville Power Authority are gambling there will be a good water season in the Pacific Northwest next year.

If they win, aluminum companies will be able to keep their Northwest plants in full operation at considerable savings in power costs.

If they lose, aluminum and other companies may have to either close down a sizable part of their operations in the Northwest or pay off their gambling debt with huge hunks of more costly steam-generated electricity.

The gamble involves drawing down water storage at Hungry Horse Dam below normal levels to increase the output of power plants downstream in the Columbia Basin. With an average to good water season, this reserve can be replaced with no trouble. But with a bad water year, the aluminum companies would pay heavily.

This is the way the gamble is set up:

Each of the producers operates a part of his plant on cheap, "interruptible" power from the BPA system. This "interruptible" power is, as the term implies, available only after all firm power demands are met by BPA.

BPA keeps a close watch on water levels in its storage dams during the late fall and winter seasons, regulating the flow through power plants according to the amount stored. If it cuts down on power production, the "interruptible" customers are the first hit.

Drawdown at these large dams is based on an elaborate rule curve based on river flows over the recorded history of the stream. At Hungry Horse Dam on the South Branch of the Flathead in Montana, for instance, BPA knows that it can pull down 800,000 acre-feet of water during a storage season with full assurance that a minimum river flow will replenish it. Below that amount, hydraulic engineers want firm assurance that the water will be replenished before they pull down more water.

They get this assurance from the snow surveys taken in the watershed which feeds Hungry Horse dam reservoir. These show snow depths, and hence the amount of water that may be expected to flow into the reservoir next spring. The results of the first of these surveys come in January 1.

Thus BPA apportions out the 800,000 acre-feet of water over the period running from Sept. 15 to Jan. 1. It knows that much will be replenished. But it does not pull down any more until the snow surveys indicate how much more than the minimum of water can be expected.

Now the aluminum companies have come up with this proposition: "Let's take a chance that it will be an average or better water year. Cut into your reserve to firm up our interruptible."

If that had been the whole proposition, BPA would have turned it down flat.

But there was another side to the proposition. The aluminum producers offered to pay back this reserve account if BPA is caught short. They would do this either by curtailing their own take of firm BPA power or by going outside the government system and buying power at costs up to ten mills to replace the power they are now using from the Hungry Horse drawdown.

With any kind of luck, the companies stand to gain. The odds are roughly 20-to-1 in their favor, since on the average there is only about one bad water year in every twenty.

Father of this complicated deal is William A. Dittmer, former BPA power manager, now employed by Kaiser Aluminum.

The agreement went into effect early last week after BPA cut off all its regular interruptible power. It is being tried out with the understanding that formal agreements will be signed either this week or next.

Col. Robert G. West dies; noted for flood control

Col. Robert G. West, flood-control expert and chief technical assistant in the office of the Ohio River Division, Corps of Engineers, died in Houston, Tex., last week. He was 56 years old.

In 1918, Colonel West was graduated from Virginia Military Institute with a degree in civil engineering and the rank of second lieutenant. Nine years later he joined the Corps of Engineers in a civilian capacity, serving in Pittsburgh, Wilmington, N. C., and St. Louis before going to the Ohio River Division in 1933.

During the 1937 Ohio Valley flood, Colonel West helped direct defensive operations. Afterwards, he played a key role in setting up plans for future flood control in the area by use of reservoirs, floodwalls and levees. In 1941 he was named chief civilian engineer of the Ohio Division.

He was called to active duty in 1942 and, as assistant division engineer, helped direct construction of many military installations. After the war he remained in the reserves as commanding officer of an Engineer unit.

Penn Center

An ambitious Philadelphia development begins with 20-story skyscraper

Philadelphia's Penn Center crossed the threshold from blueprints to actual construction last week. Ground was broken for the center and for the first building to be erected on the mid-city site.

Following the ceremonies, Uris Bros., New York specialists in building and managing skyscrapers, began excavation for a 20-story $15-million office building (ENR June 4, p. 65). This structure will occupy only part of a block-long plot along Market St. between 15th and 16th Streets, leaving an area for landscaped gardens, pools and open-air dining. Completion is set for early 1955.

At a later date, Uris Bros. will announce details of a companion office building to be erected just north of the structure now getting under way.

The task of demolishing the 72-year-old Broad Street Station and Pennsylvania Railroad's so-called Chinese Wall—on the site where Penn Center will arise—started less than 19 months ago (ENR Nov. 6, 1952, p. 48).

Several other buildings also have been scheduled for the development. Walter H. Annenberg, editor and publisher of the Philadelphia Inquirer, plans to erect a community and transportation center on the block bounded by 17th and 18th Streets, Pennsylvania Blvd. and Market St. The Sheraton Corp. of America will build a 1,000-room hotel on the north side of Pennsylvania Blvd. between 17th and 18th Streets.

Penn Center buildings and plazas, plus a 1,000-ft-long, 80-ft-wide esplanade will cover the entire area between City Hall and 18th St. from Market St. to Pennsylvania Blvd. Plans also include a shop-lined thoroughfare below street level, offering convenient access to a suburban station and to city concourses (ENR Feb. 12, p. 41).

$6-million low bid for Webster Dam work

Two Jackson, Miss., firms submitted a joint low bid of $6.1 million for construction of Webster Dam on the south fork of the Solomon River in north central Kansas. The bid by Edward E. Morgan Co., Inc., and Jones & Gillis, Inc. was under the Bureau of Reclamation estimate by a little over $1 million.

Foundation for the rolled earth fill dam—a key project in the Kansas River Basin flood-control program—was completed recently.

OUTLET PORTAL of Tecolote Tunnel emphasizes small bore and water flow. Nearly a foot of water covers invert despite two 12-in. dia pipes (lower right) for removing 3,600-gpm flow. Moistened burlap on air pipe did not keep air sufficiently cool.

Lining of Tecolote Tunnel to heading is planned to overcome intense heat

Construction will be resumed soon on Tecolote Tunnel of the Cachuma Project in Santa Barbara County, Calif., which was shut down in July when high ground water temperatures produced intolerable working conditions.

A new sequence of operations will be adopted to complete the final 4,716 ft of the 33,557-ft tunnel, involving concrete lining by steps of the 13,922 ft of the outlet and of the tunnel already dug.

The new program, as outlined by the office of I. N. McClellan, Assistant Bureau of Reclamation Commissioner in Denver, was based on a study made by a special board of consultants (ENR Sept. 24, p. 26). The consultants included Rush T. Sill, engineering partner of the Ruscardon engineering firm in Los Angeles; Frank Purvis, tunnel superintendent of the Magoffin Construction Co., Denver, and Walter R. Young, president of Thompson Pipe & Steel Co., Denver.

Work was stopped when water entering the tunnel at a 3,600-gpm rate got as hot as 112 F. At the heading this raised air temperature to 107 F and humidity to 100%. And, because temperatures were increasing at the rate of about 1 F for each 100 ft of tunnel advance, the work was shut down by Halvorsen Constructors (a joint venture of Carl Halvorsen, Inc. and H. Halvorsen, Inc.) holders of a $4.8-million contract for the tunnel. One purpose of the shutdown was to get a clear definition of the costs to be borne by the contractor and by the government as a result of the unforeseen conditions.

An attempt had been made to continue operations by forcing more air to the tunnel heading. But limited size of the tunnel (it will be a 7-ft dia horseshoe inside the concrete lining) restricted the amount of air piping that could be used. And hot water from the underground springs heated the entire length of the bore so that the air was hot by the time it reached the heading.

• **Program for lining**—First step in the new program will be to place a concrete bulkhead part way in the tunnel. This will seal off some of the hot water and cool the tunnel sufficiently so that it can be concrete lined. Next, a second bulkhead will be placed further along and the tunnel lined up to it. This will be repeated in steps until the heading is reached. The concreting program will be more expensive than originally anticipated as it will be done out of sequence.

Even after lining of the completed portion of the tunnel, considerable heat is expected. Plans are under way to counteract this by bringing high-pressure air to the heading in a relatively small-sized pipe and releasing it through a turbo-generator. Resulting adiabatic expansion will supercool the air. This plan cannot be put into effect immediately as it will take some time to get delivery on the necessary equipment.

All of this means additional cost and it is expected that an adjustment in the contract price will be made. The additional work will not upset existing repayment contracts with local districts as they are of water service type.

The 3,600-gpm flow developed by the tunnel has been put to good use in supplying the city of Santa Barbara and nearby areas. This flow resulted even in spite of an extensive grouting program to shut it off. Plans call for tapping of water behind the concrete lining after completion of the tunnel to add to the local supplies.

Meanwhile, the upper end of the tunnel is being concrete lined. It was stopped after 14,919 ft of length had been excavated and temperatures had risen to 78 F. Further excavation of this portion of the tunnel was considered uneconomical because of the downhill slope. Besides that, the Cachuma reservoir might fill during the coming winter season and cover the tunnel entrance. This would necessitate excavation of a construction adit.

New York Coliseum project under way

Demolition crews have begun clearing an area on the west side of New York City's Columbus Circle at the southwest corner of Central Park for the $40-million New York Coliseum and related housing project (ENR Dec. 11, 1952, p. 48), following a Court of Appeals ruling granting the city title to the site.

Classed as urban redevelopment, the project will consist of two 12-story apartment buildings costing $20 million and a $20-million convention hall and garage.

First considered back in 1946, the program has been held up primarily by property owners who held that the site could not be cleared under the federally aided urban redevelopment plan since it was not a slum area.

Scheduled for completion in the fall of 1956, the Coliseum will provide garage space, stores and restaurants, and 225,000 sq ft of clear floor space for conventions and commercial displays.

The planners believe that the building should draw a great deal of the convention business which has heretofore been lost because of a lack of adequate facilities.

New York's Triborough Bridge Authority will build and operate the Coliseum, and architects are Leon and Lionel Levy. Purnia & Marx, realty sponsors of the apartment housing units, will hold off clearing their site until the last possible legal obstacle has been overcome—property owners could still appeal to the U. S. Supreme Court for a stay.

Factory illuminated by new-type lamps

A $5-million factory just being completed for the manufacture of pressure vessels for Foster Wheeler Corp. at Mountaintop, Pa., near Wilkes-Barre, is being illuminated with recently developed incandescent lamps providing 30 ft-c over the entire work area.

The interior of these 750-w lamps is silvered, eliminating the need for external reflectors, which require maintenance. A cost comparison indicates that this installation will be less expensive than one with mercury vapor lamps.

The high bay shown above is 90x800 ft by 75 ft high, with 50-ft clearance under the cranes. The building also includes a 35x500-ft side bay and 35x450-ft office wing. It has a structural steel frame, asbestos-cement exterior walls, and roof deck of precast wood-fiber concrete. Shop connections for the steel frame were riveted, but field connections were made with high-tensile bolts because of a shortage of riveters in the region. An adjacent building, still under construction, containing a 2,000,000-v X-ray generator, will have 4-ft-thick concrete walls.

The plant was designed by Foster Wheeler. Sardoni Construction Co., of Wilkes-Barre, is the general contractor, with steel fabrication and erection being carried out by Ingalls Iron Works.

Chicago bids for engineering societies

Chicago made a strong bid last week for the new $6-million headquarters building which the country's four "founder" engineering societies hope to erect because they have outgrown the building that they own in New York City (ENR Sept. 3, p. 23).

Whether a larger building will be obtained in New York or whether the headquarters will be moved elsewhere is a problem with which the societies have been actively concerned for more than two years.

The offer of a site in Chicago as well as capital benefits and services valued at more than $1.1 million were presented to a five-man committee representing the societies, after it inspected proposed sites on the campuses of Illinois Institute of Technology, University of Chicago and Northwestern University.

James L. Head, committee chairman and president of United Engineering Trustees (the corporation which the four societies set up in 1904 to hold title to the present headquarters) said that the societies will "find it difficult" to make a final selection from among the cities competing for the building. Pittsburgh, with an offer to erect a new building, if the societies buy the land, thus far has made the best financial offer "Frankly, we're shopping around for the highest bidder," Head said.

• **Illinois Tech's offer**—Illinois Tech is ready to provide five acres on its campus, valued at $500,000. In addition, it offers an estimated $650,000 in various services ranging from use of its central heating plant to parking facilities.

The Chicagoans listed a number of arguments for establishing the societies' headquarters in their city. They claimed the city's location and transportation connecitons make it more conveniently accessible to the majority of the membership. Other advantages of Chicago cited were convention accommodations, exhibit facilities, proximity to a number of industrial centers, and the city's million-volume John Crerar Technological Library.

The committee represented: the American Society of Civil Engineers, the American Institute of Electrical Engineers, the American Institute of Mining and Metallurgical Engineers, and the American Society of Mechanical Engineers.

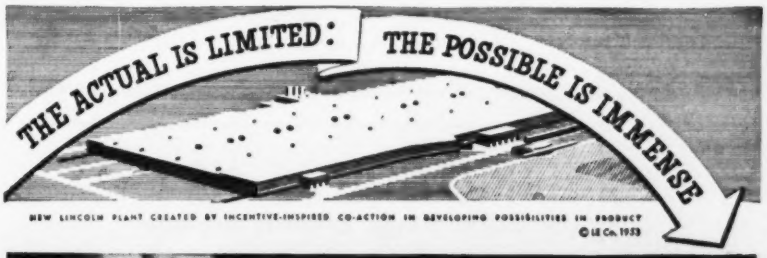
News briefs . . .

• **Chicago subway contract**—Santucci Construction Co. of Skokie, Ill., is the apparent low-bidder on a contract to build twin underground tubes for extension of the present Milwaukee-Dearborn-Congress St. subway in Chicago. Estimated cost of the project is $3.2 million (ENR Oct. 22, 1953, p. 22). The half-mile-long route will run along the Congress Street Expressway—now under construction—from the Chicago River's west bank to DesPlaines St.

• **New Navy building**—The year's largest single-building construction project in the Norfolk-Portsmouth, Va., area has been started by the Navy in its shipyard at Portsmouth. The $4.2-million structure (5 and 6 stories, 581 ft x 195 ft) is scheduled to be finished by July, 1955. General contractor: Cramer-Vollmerhause Co., Inc., Washington, D. C. Foundations contractor: Raymond Concrete Pile Co., New York. Designers: Harley, Ellington & Day, Inc., Detroit; Hayes, Seay, Mattern & Mattern of Norfolk and Roanoke, Va.

• **Flood-fighting funds**—The Reynolds Metals Co. is putting up cash (amount not revealed) for dike work near its aluminum reduction mill at Toutdale, Ore., beside the Columbia River. The firm spent some $100,000 during the 1948 flood to save earthworks protecting the plant. Since Congress might not vote dike-work funds in 1954, Reynolds will contribute to area aid now—rather than having to fight future high waters just to save its own building.

• **Clean-up campaign**—The reservoir level behind Detroit Dam on Oregon's Santiam River is being lowered 6 in. a day to winter elevation of 1,340 ft. The reason: to reset electrical devices on the gates and to clean out debris in the pool area. Summer elevation (since the dam's dedication in June) was 1,525 ft.


THE ACTUAL IS LIMITED:
THE POSSIBLE IS IMMENSE
NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT
© LE Co. 1953

DON'T BUY HARDSURFACING JUST BECAUSE IT'S HIGH PRICED

THERE'S a notion that a hardsurfacing electrode must be high priced to give proper service. This is not true and here's why:

By proper combination of alloy materials plus efficient, mass manufacturing, Lincoln hardsurfacing electrodes, costing one third as much money, produce equal and more often superior resistance to impact and abrasion.

1. Lincoln "Abrasoweld" sells for 25 cents a pound. This is only about one third the cost of other hardsurfacing electrodes.

2. Lincoln "Faceweld" sells for 60 to 70 cents a pound . . . comparable rods cost $2.60 a pound.

Remember, in spite of these low prices, *you still get high alloy content* in Lincoln hardsurfacing . . . top resistance to impact and abrasion, which means low end-of-service cost. So why pay the high prices?

MAKE YOUR OWN COMPARISON. Try a sample order of "Abrasoweld" and "Faceweld". Your own jobs will prove that hardsurfacing costs can be cut 30 to 50 per cent!

A Hardsurfacing Expert is available in every Lincoln District Office. Ask for him to help solve your problem.

SEND FOR NEW LINCOLN HARDSURFACING GUIDE

Gives latest data on selecting correct hardsurfacing. Available by writing on your letterhead to Dept. 2310.

THE LINCOLN ELECTRIC COMPANY
CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

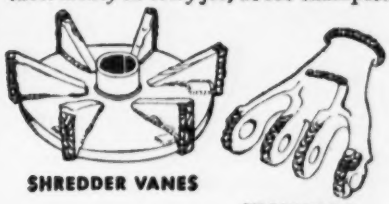
LINCOLN'S HARDSURFACING COST SAVERS

ONLY TWO RODS yet they solve 9 out of 10 hardsurfacing jobs

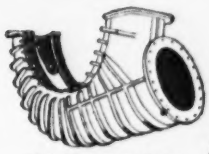
Lincoln "Abrasoweld" . . . a high carbon-chromium alloy for severe impact and abrasion.

Lincoln "Faceweld" . . . has chromium carbide crystals for severe abrasion and impact.

Simplify Your Inventory. Why stock a wide variety of hardsurfacing electrodes? Lincoln's unique "Abrasoweld-Faceweld" combination is ideal for 9 out of 10 hardsurfacing jobs . . . and *saves money on every job,* as for example:


SHREDDER VANES

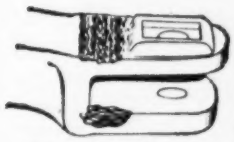
CROWFOOT


PUMP CASING

DIPPER TOOTH

DRAG CHAIN

PUMP IMPELLER


DRAGLINE CLEVIS

SPROCKET

CUTTER HEAD

WORM

Regional pacts on rise in Washington, Oregon

Regional labor agreements are largely replacing local agreements in the western Washington building and heavy construction industries, with one union negotiating for one wage scale to cover all of Washington and Oregon.

The Seattle, Tacoma and Mountain Pacific chapters of the Associated General Contractors recently signed a unified agreement with the Western Washington Laborers Council for the first time. Previously laborers have negotiated separate contracts with building and heavy construction contractors, with varying scales, but next year all laborers will receive $2.25 an hour, regardless of the type of their work.

Carpenters and piledrivers also have negotiated tentative regional agreements, with ratification now up to the local unions. Carpenters would get $2.65 an hour and piledrivers $2.70 or $2.75, depending on which of two alternate agreements they accept.

Ironworkers have asked for negotiations on an even broader-two-state-basis, Washington and Oregon.

Labor briefs . . .

• **Wage hike at Hanford**—Engineering employees of Kaiser Engineers, Inc., engaged in a construction project for the Atomic Energy Commission at its Hanford Works near Richland, Wash., have received a wage increase averaging 25% under a new contract between the company and the Technical Engineers & Architects Assn., (AFL). Monthly increases range from $43 to $140, affecting rodmen, chainmen, transitmen, draftsmen and inspectors. Retroactive paychecks range from $450 to $1,300. New monthly scales range from $360 to $500.

• **State deducts AFL dues**—In Tennessee, the state has agreed to deduct $2 monthly AFL union dues from the salaries of those highway department employees who authorize it.

• **Cost-of-living raise**—Some 12,000 construction workers in South Florida are slated to receive a 5-cent hourly cost-of-living wage increase. The boost was agreed to by the Construction Industry Council of Dade County, composed of 14 construction trades unions and 10 contractor associaitons.

CONSTRUCTION TRENDS

Despite obstacles, fringe benefits are now solidly established in the building industry

Fringe benefits—in the form of welfare and pension funds, paid holidays and vacations—were late in reaching most construction workers, but they are spreading fast through the industry. Fringe-benefit payments by employers were reported this year in more than half of the 61 cities listed in the building trades wage rates published by ENGINEERING NEWS-RECORD, against a few isolated instances in 1950.

Wage control in World War II diverted interest to fringes in some cities, and in 1945 and 1946 several trades in New York City negotiated welfare funds and paid holidays. A further spur came with wage stabilization during the Korean war, when 7½ cents an hour in fringes was authorized for construction workers in addition to wage increases. The appeal of vacations, welfare funds and pensions now has taken firm hold. Unions want to bargain new plans and sweeten existing programs for their own sake—not just to get all that's coming under wage controls.

• **Problems**—Big obstacles to fringe benefits in construction have been irregularity of employment and mobility of workers. Relatively few workers stay with one employer long enough to benefit from the vacation and pension plans typical in manufacturing. Half the employees in construction in January 1951, had been in their current jobs 1.4 years or less, compared with 3.6 years for the average worker in manufacturing, according to a special study by the Bureau of Census. Furthermore, maintaining a welfare or pension fund would be an almost impossible burden for the many small contractors in construction.

Irregularity of construction work has led to the use of local building trades unions as units for establishing benefit programs, though employer trustees participate to satisfy Taft-Hartley requirements. Customarily, the employer contributes a specified amount in cents per hour or percentage of payroll to the funds maintained by unions representing workers on a job. Eligibility for benefits—life insurance, hospitalization, surgical and medical insurance—is determined by length of employment and union membership. (Legal squabbles have developed over the status of non-union workers.) Funds have also been set up to provide paid vacations.

Having benefit plans set up on the basis of local building trades unions has provided the answer to the problem of irregular employment in most large cities. Nearly all of the building trades in the largest cities now have well-established benefit funds. However, in areas where workers may move many miles from job to job, the local union does not provide an adequate base. International unions are showing interest in this problem as welfare funds spread into smaller cities and more fluid labor markets. Pension funds, with complexities in vesting rights, present especially tough questions when workers move from one area to another.

• **Doesn't hold 'em**—What effect has this mushrooming of fringe benefits had on mobility of construction workers? So far, apparently not much. Younger workers do not regard loss of distant pensions as a deterrent to moving into a new area with better job prospects. And older workers frequently are tied to an area anyway for reasons other than fringe benefits, such as home ownership.

As in other industries, employers in construction are finding fringe benefits an expensive item and an increasing component of costs. Employer contributions to 27 building trades funds in New York City alone in 1951 amounted to almost $8 million. New contracts will raise contributions next year to 10% of wages in some instances. This is in addition to legally required payments for Social Security, unemployment compensation and other fringes provided by agreements.

Meet the U. S. Rubber Hose they couldn't squash or cut!

This immensely heavy crane rolled repeatedly over the U.S. Royal Cord Air Hose in left foreground. Hose remained unharmed, even though ground was paved with sharp shells.

In the 14 months it took to build a large aluminum plant in Texas, U.S. Royal Cord Air Hose took a beating which amazed construction men. 50-ton cranes on tractors, trucks carrying steel girders or gravel, ran over it again and again. *No cribbing was used.* The pavement was surfaced with very sharp and abrasive oyster and clam shells. Yet the hose suffered no damage, not even when carrying 125 pounds of water closed off at the end! Weathering and salt air had no effect on it. What's more, every foot of the hose is now being used in the finished plant.

If there ever was a hose you can thoroughly abuse, U.S. Royal Cord is it. You don't have to waste time and money cribbing it. Move it about at will. It's the only cord hose built with true tire construction.

This is the sort of endurance you can count on in any United States Rubber Company product. There are 25 "U.S." District Sales Offices, staffed with engineers to serve you. Or write to address below.

Constant stream of heavily loaded vehicles at considerable speed roll over the U.S. Royal Cord Air Hose on hard packed roadway. Hose suffered no damage.

U.S. RUBBER
SERVING THROUGH SCIENCE

"U.S." Research perfects it. "U.S." Production builds it. U.S. Industry depends on it.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

AFTER 3 YEARS OF RESEARCH AND ON-THE-JOB TESTING

Plasteel

MICA makes the DIFFERENCE

proudly presents the only protected metal

ROOF DECK

with Built-In Vapor-Barrier

This is how PLASTEEL protects . . .

8 WAYS BETTER

- **VAPOR BARRIER** built into roof deck. No additional layers of felt and tar necessary under the insulation.
- **SOUND ABSORBENT** surface reduces dangerous reverberant noise prevalent where ordinary metal roof deck is used.
- **FIELD PAINTING ELIMINATED** by factory coating of asphaltic-plastics with attractive MICA surface.
- **FULL 24" WIDE COVERAGE,** results in greater coverage and speedier erection.
- **TELESCOPING ENDS** provide for snug nesting of end laps. Gives smooth unbroken roof surface.
- **MICA FINISH** gives good light reflectivity and attractive appearance to underside of deck.
- **NO METAL-TO-METAL CONTACT** possible with asphaltic-plastics coating.
- **NO MAINTENANCE** or periodic painting needed.

PLASTEEL PRODUCTS CORPORATION
WASHINGTON, PENNSYLVANIA

Please send Plasteel Roof Deck details

Company Name.....

.....

Attention of..... *Title*

Address.....

City..... *State*.....

Tested and Classified by Factory Mutual Laboratories

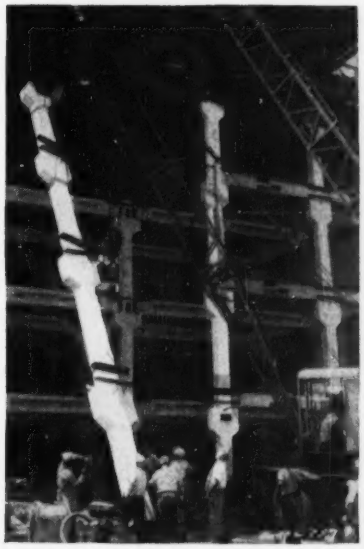
ROOFING • SIDING
Plasteel
MICA PROTECTED STEEL
INSULATED PANELS • ROOF DECK

PLASTEEL PRODUCTS CORPORATION

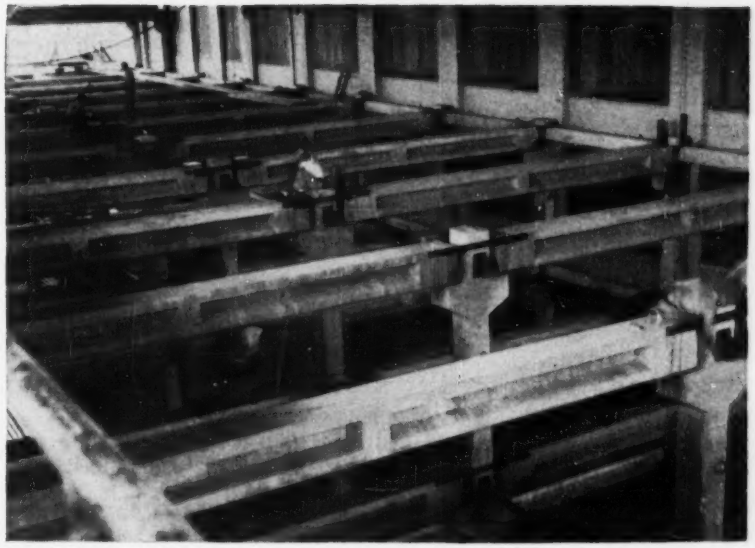
OFFICES AND FACTORY

WASHINGTON, PENNSYLVANIA

SALES OFFICES IN PRINCIPAL CITIES



PRECAST COLUMNS were erected with a 30-ton pneumatic-tired crane.



STRUCTURAL FRAMING for a multistory office building near Baltimore consists of precast columns and prestressed beams.

3-story prestressed building is U.S.' tallest

F. W. Wilcox
Plant Engineer
The Glenn L. Martin Co.
Baltimore, Md.

An office building three stories high now under construction at a Baltimore, Md., plant of The Glenn L. Martin Co. will be the tallest structure in the United States to have a prestressed, precast concrete frame.

Precast columns extend from the basement to the third floor. They support prestressed, precast beams spanning 30½ ft at the first, second and third floors. The roof, however, is supported on 61-ft steel trusses.

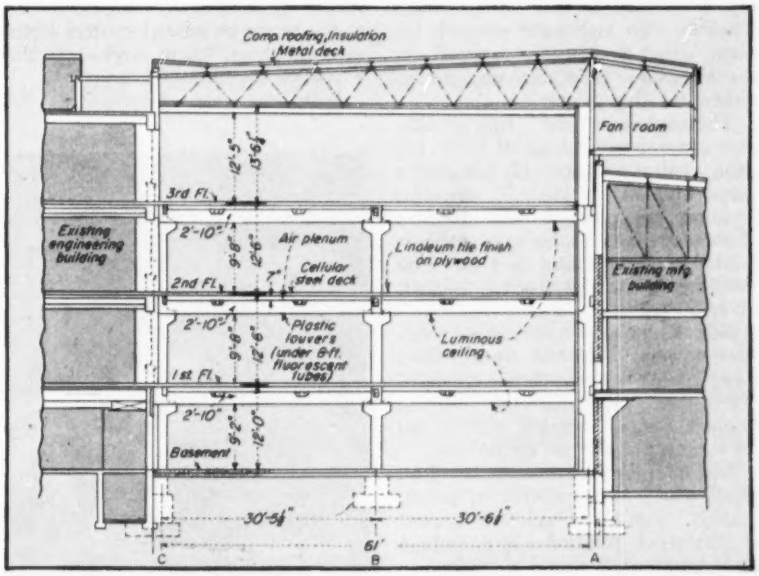
In designing and erecting the precast members, GLM engineers took advantage of experience they had just gained in building a mezzanine with similar framing inside an existing manufacturing plant at the same site (ENR June 18, p. 32). This type of construction had enabled them to fabricate and erect the mezzanine in six months—in less time than required for delivery of structural steel.

There was need for haste in completing the new office building, just as there had been for the mezzanine. The new structure had to be completed to a stage at which it could be tied into an existing building while the plant was shut down for the annual two-weeks vacation period. Construction costs were sufficiently favorable that GLM engineers specified prestressed and precast concrete members for the new structure.

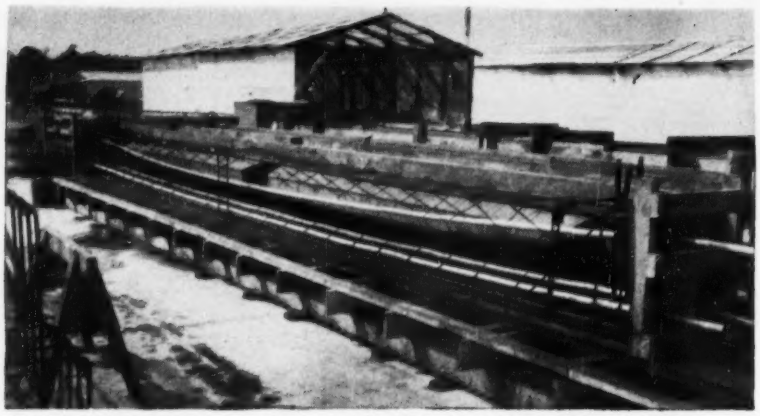
• **Tight fit**—Filling a 62x364-ft gap between two existing buildings of about the same height—one containing the plant's aeronautical engineering staff; the other, manufacturing space—the three-story office building will provide additional room for the engineers. Its floors and columns, therefore, are lined up, for convenience, with the floors and columns of the engineering building.

The roof, however, is higher than the adjoining roofs. It is supported on structural steel columns resting either on the framing of the existing buildings or on wall columns of the new structure.

Precast columns are spaced 16 ft c-c along the walls of the older buildings and along the middle of the office building. Floorbeams span 30½ ft between columns in the transverse direction, while cellular steel decking spans the 16 ft between beams. Since there are no beams in the longitudinal direction, the center columns are braced below each floor with 4-in.



NEW OFFICE BUILDING fits into a narrow space between two existing buildings. Steel roof trusses span the opening, while floors are supported on three rows of columns. Offices will be air conditioned and lighted by luminous ceilings.



INSIDE BEAM FORM is reinforcing steel and flexible tubing housing prestressing steel.

dia pipe struts, and the wall columns, with precast concrete struts. The floors are designed for a 100-psf live load.

• **Members cast nearby**—The casting yard that was used for the mezzanine framing was also utilized for the precast members of the office building. Laid out on a concrete apron measuring 300x325 ft, it is located about 400 yd from the construction site.

There, on an assembly-line basis, reinforcing steel was fabricated into cages and set in forms; truck-mixed concrete was placed and cured; and prestressing steel was tensioned. Finished members were transported to the job on long trailers that are normally used for hauling aircraft components. Erection was accomplished with a 30-ton pneumatic-tired crane.

With this setup, there was no difficulty in producing columns and beams rapidly enough to meet the erection schedule. So high early strength cement, which had been a necessity for the mezzanine members, was not required for this project.

The contractor used 7 bags of ordinary cement and 36 gal of water per cubic yard of concrete. He obtained a 4-in. slump with a 1:2.1:2.6 mix, plus a plasticizing agent. In this mix, size of the pea-gravel coarse aggregate was limited to a maximum of ¼ in. The resulting concrete attained a strength of 4,000 psi in 7 days.

Side forms were removed the day after casting. Bottom forms, however, could not be recovered until the seventh day, when the concrete reached design strength (3,000 psi for columns, 4,000 psi for beams).

Bottom forms were made of 2-in. plank, which was supported on 6x6-in. timbers. Side forms were constructed of ¾-in. thick plywood and assembled by bolting.

• **Column details**—Columns are of ordinary reinforced concrete construction. About 40 ft long, they weigh nearly 12 tons apiece.

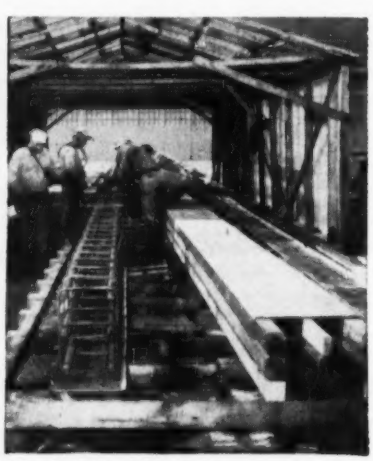
In cross section, columns along the existing engineering building are 14x 20 in.; those along the wall of the manufacturing building are 16x20 in. And the center columns are 16x24 in. Just below first, second and third-floor levels, these members flare out 15 in. to form a seat for the beams.

Most of the columns have a plain concrete base. These members were seated in an open-box concrete foundation (see sketch). After they had been aligned and adjusted to the proper elevation, the box was filled with grout. A few columns had steel plates welded to the reinforcing rods at the base, for a conventional baseplate connection to a concrete footing.

Where beams frame into the columns, horizontal through bolts were embedded in the column concrete to anchor horizontal steel angles. Bolted to the beams or welded to steel plates in their sides, these angles tie the beams to the columns.

Bolts also were embedded in the center columns to anchor T-sections, which are used for connections with the longitudinal pipe bracing.

The reinforced concrete struts between wall columns are bolted to the angles that tie the beams to these columns.



REINFORCING for three-story high columns was welded into cages.

• **Prestressed beams** — Spanning the building in the transverse direction, the beams are H-shape in cross section, except for short lengths of rectangular section at the ends and center. Weighing 6.2 tons apiece, they are 20 in. wide and 24 in. deep.

Prior to the casting of concrete for the beams, a small amount of reinforcing steel for stress distribution, plus some handling and connection inserts, were placed in the forms. Also, since prestressing bars were not to be bonded to the concrete initially, inserts were set in the forms to provide holes for the bars.

These inserts consisted of flexible, light-gage metal tubing with a dummy steel bar temporarily inside, pending delivery of the prestressing steel. When the concrete had attained sufficient strength for prestressing, the dummy bars were removed and the high-strength bars inserted.

Typical beams were prestressed with three 1⅛-in. dia bars with threaded ends. The threads enabled a jack to grip the bars and also permitted anchoring them by the tightening of a nut against a steel plate in the beam ends. All three bars are curved in a vertical plane to give the prestressing force an upward component.

Each bar was tensioned to 100,000 lb in one step, with a hydraulic jack. (Design prestress is 15% less, assuming losses due to shrinkage and plastic flow of the concrete and creep of the steel). This task was carried out by three men, who tensioned about 40 bars per day.

After the bars had been anchored at the beam ends, grout was forced into the tubing to establish bond between the bars and the beam concrete. Piping had been welded to the tubing in advance for this purpose.

Here, in particular, GLM engineers gained from their experience with the mezzanine framing. They increased the size of the grouting tube from ⅜ in. to ½ in. and reduced bends to less than 90 deg. to make pumping of the grout easier. Also, they found it advisable to feed the grout into the bottom of the light-gage bar housing; for on the previous job, they had learned that the bars, when tensioned, move to the top of the enclosure, leaving a void underneath.

• **Simple erection**—The steel roof trusses, supported on the adjoining

Public Works . . . *and The National City Bank of New York*

Growing populations demand schools—hospitals—roads

If you live in an average community, you've built more than one new school during the past five years. You've either built or have helped another community to build or add on to a hospital. Your state, county or town fathers are probably wondering how much longer they can get by without expanding their water and sewerage systems. And you've almost surely remarked, as you've driven around, that something had better be done about the roads, or there won't be any left.

All this need for new construction is partly an outgrowth of our soaring birth rate, which hit a record high in 1947. Some of it is due to greater emphasis upon health and medical care. And a lot results from the lag in construction during the depression, the Second World War, and the Korean emergency.

This backlog of city, county and state public works projects has resulted in a rapidly rising rate of borrowing, which reached a level above $4 billion in 1952.

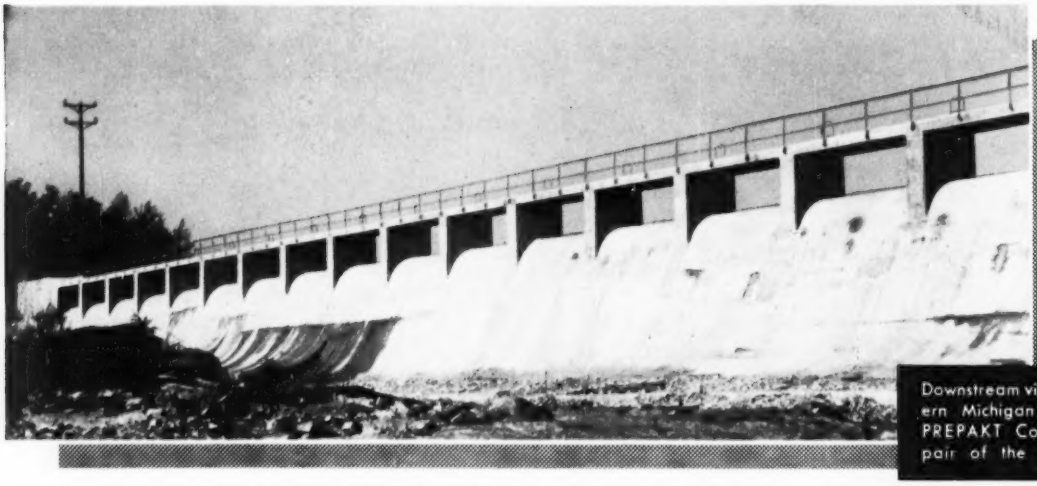
As in the past, The National City Bank of New York will help citizens across the country finance their schools, hospitals, utilities, highways, and other public works.

The Bank not only invests its own funds in state and local public works securities, but plays a continuing active part in their underwriting and distribution. In 1952 alone, it participated in the sale of more than $750 million of such obligations. Thus the Bank shares in the civic progress of many communities, as well as in fostering the development of commerce and industry.

For information, write: The National City Bank of New York, 55 Wall Street, New York, N. Y.

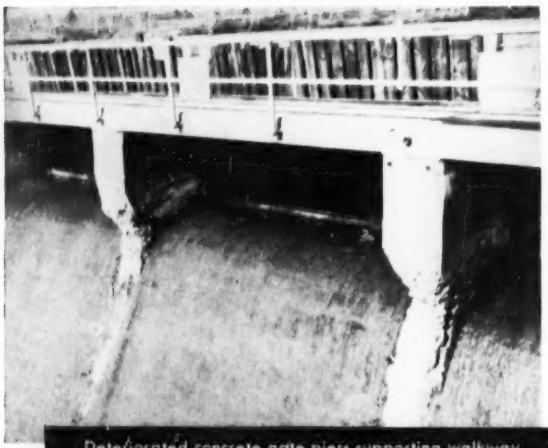
Member Federal Deposit Insurance Corporation

First in World Wide Banking



Downstream view of Northern Michigan dam after PREPAKT Concrete repair of the gate piers.

FOR ECONOMY IN LONG LASTING CONCRETE REPAIR CHOOSE PREPAKT!



Deteriorated concrete gate piers supporting walkway across top of dam.

Repaired piers showing structure of high-strength weather-resistant PREPAKT CONCRETE.

The use of PREPAKT Concrete and PREPAKT methods provided outstanding construction economies in the repair of this Northern dam. But, more important, it provided the pier structure with long-lasting high strength and exceptionally strong bond plus resistance to freezing and thawing action.

PREPAKT Concrete is extremely dense and requires 30% to 60% less portland cement than ordinary concrete of equal strength. This results in high impermeability to moisture and high resistance to all forms of deterioration.

PREPAKT Concrete may be made under water as well as in the dry, and PREPAKT methods provide underwater placement without costly caissons or unwatering operations.

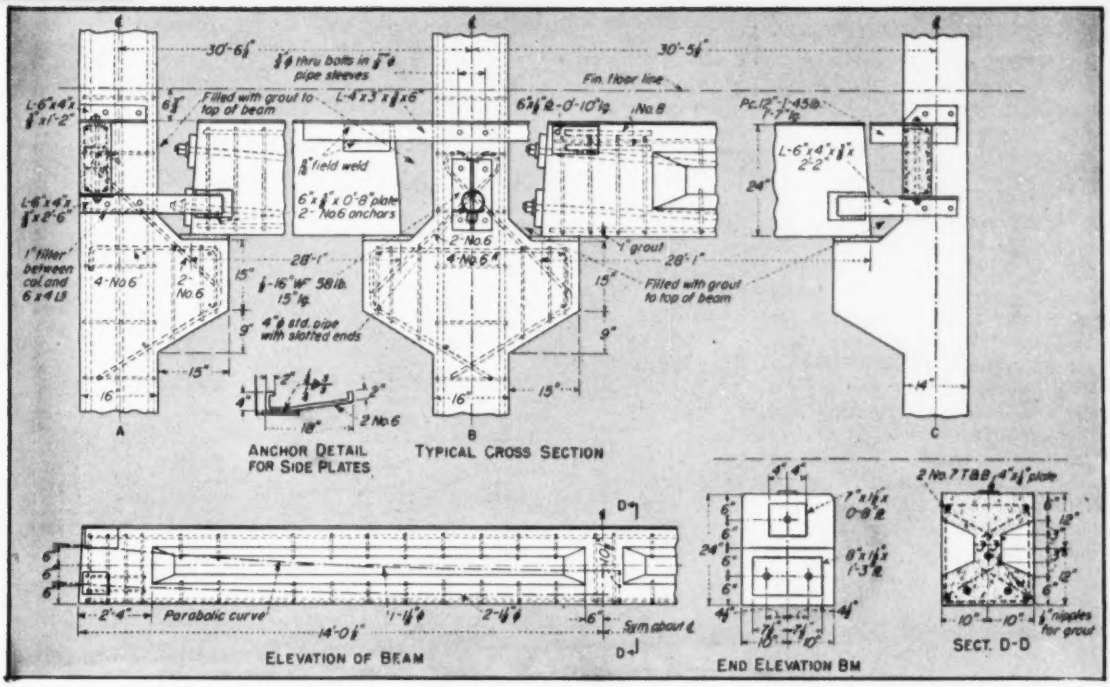
This and many other PREPAKT advantages make it a natural choice for all types of structural concrete.

Full information on this and other PREPAKT installations may be had by calling or writing the Main Office at Cleveland 14, Ohio.

INTRUSION-PREPAKT, INC. **THE PREPAKT CONCRETE CO.**

CLEVELAND 14, OHIO CHICAGO · PHILADELPHIA · ATLANTA SEATTLE · SAN FRANCISCO · DENVER **TORONTO, ONT.**

ZURICH · PARIS · MADRID · STOCKHOLM · HELSINKI · BERLIN · LONDON · HAVANA



BEAM-TO-COLUMN CONNECTIONS are made with angles bolted to columns and welded to plates on the beams. Pipe braces for columns have slotted ends to slide on webs of T-sections bolted to columns. Beams are prestressed with high-strength steel bars.

buildings, were erected first. The roof was constructed next, placing the site under cover, so that foundation work and erection could be carried out regardless of weather. This covering consisted of a light-gage steel deck, ½-in. thick cane-fiber insulation board and builtup roofing—all carried on steel purlins spaced 8 ft on centers.

The precast columns, when erected, reached only to the third floor, one story below the trusses. Until they could be braced, they were tied to the trusses with rope.

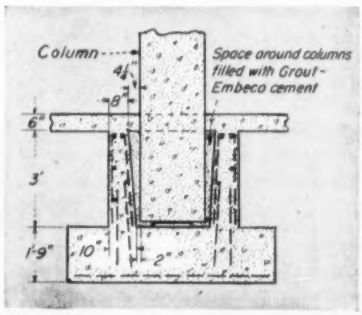
The beams were set on metal shims on the column seats. Those erected first were bolted to the angles attached to the column faces. But due to difficulties in aligning holes in the angles with bolts through the beams, this connection was superseded by one permitting greater tolerances: The angles were welded to steel plates in the sides of the beams. (Welded to anchor bars, these plates had been set with the inserts that were placed in the beam forms before the concrete was cast.)

Connecting pipe struts to brace the center columns longitudinally was a simple matter. Flanges of a T-section (half of a wide-flange beam) were bolted to the sides of each column, with the web in a vertical plane. Ends of the pipe were slotted. Hence, the pipe could be positioned merely by sliding these slotted ends over the T-section webs until they came to rest against metal stops welded to the webs. Then, to complete the connection, the pipe was welded to the tees.

Erection of the 320 units in the framing required only four weeks.

• **Floors go in swiftly**—After the beams were in place, ¼ x 4-in. steel strips were attached on top with a cartridge-powered tool. Next, cellular steel deck was tackwelded to these strips. Then, electric wires were strung through the cells of the deck so that power would be available at frequent intervals. Finally, a plywood subfloor was glued to the deck and linoleum tile set on top.

A sheet metal ceiling was erected below the deck to form a plenum for supply air from the air-conditioning system. Rows of air outlets were placed in this ceiling along the center line of each bay to feed air to the offices. Supply air will be distributed to the plenums through a duct along the manufacturing-building wall. Exhaust air will be returned through another duct in the same location.



FOOTING for typical precast columns is an open concrete box—filled with grout after the column was positioned.

A luminuous ceiling was installed under the air plenum. Consisting of rows of 8-ft long fluorescent tubes, spaced 24 to 30 in. apart, and plastic louvers with ⅜-in. openings, this lighting system is expected to furnish 70 ft-c initially at desk level uniformly throughout the entire area.

Only through close collaboration between the Plant Engineering Department of The Glenn L. Martin Co. and Albert Kahn Associated Architects and Engineers, Inc., Detroit, Mich., in the design of this building was it possible to achieve the speed necessary for the tight erection schedule. Construction was under the supervision of GLM. The author is in charge of the Plant Engineering Department; C. H. Skinner is chief of facilities engineering, G. W. Wadsworth, chief of building maintenance, and A. H. Woodward, project engineer.

Redding & Company furnished labor and supervision for field work. Stressteel Corp., Wilkes-Barre, Pa., fabricated the prestressing bars.

WEATHER

THE 30-DAY FORECAST of the U. S. Weather Bureau for the period from mid-November to mid-December calls for temperatures to average above seasonal normal over the eastern half of the nation except in the Gulf States, where near normal averages are expected. Below normal temperatures are indicated west of the Continental Divide and in West Texas. In areas not specified, near normal is predicted.

Precipitation amounts in excess of normal are indicated for most of the nation except in the South Atlantic and Northern Plateau States, where subnormal amounts are in prospect.

OBSERVED PRECIPITATION AND TEMPERATURE IN 20 CITIES, COMPARED WITH NORMALS

	Precipitation, inches				Temperature, degrees F.			
	Oct. 1953	Departure fr. normal	10 mos. 1953	Departure fr. normal	Mean Oct. '53	Departure fr. normal	Av. daily Maximum	Av. daily Minimum
Atlanta	0.90	−2.51	43.04	−0.57	64.0	+0.6	74.5	54.8
Baltimore	2.75	−0.62	44.31	+7.63	61.5	+2.2	70.4	52.5
Birmingham	0.21	−2.65	39.30	−5.10	65.2	+1.5	79.9	50.5
Boston	4.91	+2.12	44.98	+13.08	56.2	+1.2	64.1	48.2
Chicago	1.25	−1.31	25.28	−3.16	59.7	+5.6	71.1	48.3
Cincinnati	1.17	−1.02	24.46	−8.98	60.0	+2.6	73.5	46.4
Cleveland	1.28	−1.14	27.22	+0.09	57.4	+3.0	70.2	44.5
Dallas	3.20	+0.53	20.83	−8.54	69.4	+0.6	81.1	57.6
Denver	0.56	−0.44	11.10	−1.11	55.4	+2.4	67.4	43.4
Detroit	0.63	−1.66	21.68	−5.32	56.8	+3.9	68.4	45.2
Kansas City	1.64	−1.29	18.00	−13.64	63.4	+3.8	74.6	52.2
Los Angeles	T	−0.50	2.89	−7.51	69.1	+5.2	80.5	57.7
Minneapolis	0.15	−1.50	24.61	+2.26	57.4	+7.0	69.0	45.0
New Orleans	0.63	−3.03	52.23	−2.72	72.9	+0.1	80.4	65.3
New York	3.92	+0.88	39.84	+3.97	60.1	+3.1	67.9	52.3
Philadelphia	3.50	+0.89	43.73	+8.35	61.5	+3.0	70.2	52.7
Pittsburgh	1.23	−1.26	29.61	−1.87	57.9	+2.0	69.8	46.0
St. Louis	2.89	−0.01	21.68	−11.15	63.7	+3.1	73.8	53.5
San Francisco	0.34	−0.73	9.95	−4.22	61.6	+0.6	69.4	53.7
Seattle	3.55	+0.47	28.81	6.69	55.8	+1.4	61.7	49.9

T = less than 0.005 inches.

PRECIPITATION RANGE IN 20 CITIES, IN INCHES

Table shows range observed 33.3% of time. Rainfall heavier 33.3% of time, lighter 33.3% of time.
Computed by U. S. Weather Bureau (based on historical records of actual precipitation)

City	Nov.	Mid. Nov.-Mid. Dec.	Dec.	Mid. Dec.-Mid. Jan.	Jan.	Mid. Jan.-Mid. Feb.	February	Mid. Feb.-Mid. Mar.	March	Mid. Mar.-Mid. Apr.	April	Mid. Apr.-Mid. May	May	Mid. May Mid. June
Atlanta	2.43/3.85	2.94/4.58	3.46/5.30	3.42/5.32	3.39/5.33	3.38/5.50	3.36/5.67	3.40/6.00	3.43/6.33	3.12/5.72	2.82/5.10	2.48/4.72	2.14/4.33	2.50/4.38
Baltimore	1.56/3.12	1.99/3.43	2.41/3.73	2.59/3.85	2.77/3.96	2.57/3.68	2.36/3.39	2.48/3.76	2.59/4.13	2.59/4.17	2.58/4.20	2.76/4.30	2.94/4.40	2.73/4.42
Birmingham	2.17/3.91	2.94/4.83	3.71/5.75	3.75/5.58	3.75/5.40	3.61/5.64	3.47/5.88	4.18/6.26	4.48/6.63	3.91/5.85	2.94/5.07	3.05/4.81	3.16/4.55	2.90/4.70
Boston	2.74/4.46	2.82/4.33	2.89/4.20	2.83/4.12	2.77/4.05	2.70/3.99	2.64/3.93	2.79/4.22	2.94/4.50	2.66/4.45	2.39/4.40	2.58/4.29	2.76/4.18	2.42/3.84
Chicago	1.59/2.80	1.46/2.62	1.32/2.45	1.30/2.28	1.29/2.10	1.40/2.16	1.52/2.23	1.76/2.67	1.99/3.11	2.09/3.12	2.19/3.13	2.24/3.56	2.16/4.00	2.29/3.88
Cincinnati	1.99/3.67	2.14/3.48	2.29/3.28	2.32/3.54	2.34/3.80	2.07/3.40	1.80/3.00	2.10/3.64	2.39/4.29	2.66/3.94	2.34/3.60	2.42/3.85	2.49/4.10	2.59/4.30
Cleveland	1.82/2.77	1.76/2.66	1.70/2.56	1.65/2.58	1.59/2.60	1.55/252	1.51/2.43	1.81/2.71	2.10/2.98	2.15/3.13	2.20/3.27	2.27/3.38	2.33/3.49	2.17/3.53
Dallas	1.64/3.00	1.36/3.00	1.09/3.00	1.24/3.05	1.39/3.10	1.49/2.70	1.59/2.30	1.95/3.04	2.34/3.86	2.50/4.68	2.65/5.50	2.82/5.33	2.99/5.25	2.39/4.85
Denver	0.29/0.68	0.34/0.72	0.39/0.77	0.28/0.64	0.18/0.50	0.26/0.54	0.34/0.58	0.46/0.84	0.59/1.10	0.93/1.75	1.34/2.40	1.48/2.65	1.62/2.90	0.64/2.32
Detroit	1.77/2.73	1.70/2.66	1.64/2.60	1.63/2.59	1.62/2.40	1.55/2.45	1.51/2.50	2.14/2.64	1.77/2.78	1.78/2.76	1.79/2.73	2.14/3.20	2.49/3.67	2.66/3.88
Kansas City	1.27/3.25	1.02/1.95	0.77/1.55	0.68/1.48	0.59/1.42	0.80/1.66	0.99/1.90	1.29/2.40	1.59/2.90	1.99/3.15	2.39/3.40	2.82/4.40	3.24/5.40	3.42/5.82
Los Angeles	0.26/1.30	0.70/2.00	1.14/2.70	1.19/3.00	1.24/3.30	1.12/3.25	0.99/3.20	1.06/3.08	1.13/2.95	0.68/1.92	0.22/0.90	0.14/0.62	0.05/0.35	0.02/0.18
Minneapolis	0.67/1.57	0.62/1.44	0.57/1.30	0.60/1.19	0.64/1.08	0.58/1.08	0.52/1.08	0.75/1.38	0.98/1.67	1.34/2.14	1.69/2.60	2.16/3.29	2.64/3.98	2.89/4.49
New Orleans	2.69/4.67	2.96/4.92	3.24/5.17	3.36/5.28	3.49/5.40	3.14/5.05	2.79/4.70	3.00/5.00	3.22/5.30	2.94/5.15	2.66/5.00	2.65/5.12	2.64/5.25	3.18/5.88
New York	2.21/3.95	2.42/3.86	2.64/3.77	2.55/3.71	2.46/3.65	2.41/3.88	2.36/4.10	2.35/4.08	2.34/4.05	2.40/3.92	2.47/3.78	2.50/3.90	2.54/4.02	2.45/3.91
Philadelphia	2.36/3.50	2.50/3.70	2.64/3.90	2.60/3.80	2.57/3.70	2.57/3.69	2.57/3.68	2.60/3.84	2.62/4.00	2.56/3.91	2.49/3.82	2.44/4.11	2.39/4.40	2.54/4.25
Pittsburgh	1.84/2.92	1.96/3.00	2.09/3.27	2.21/3.20	2.14/3.13	1.96/2.98	1.77/2.83	2.06/3.15	2.34/3.47	2.32/3.44	2.29/3.40	2.39/3.58	2.49/3.75	2.68/3.98
St. Louis	1.86/3.30	1.70/3.05	1.64/2.80	1.52/2.75	1.39/2.70	1.48/2.80	1.57/2.90	1.92/3.42	2.27/3.95	2.43/3.88	2.59/4.10	2.86/4.65	3.13/5.20	2.96/5.25
San Francisco	1.04/3.30	1.62/4.28	2.19/5.25	2.34/5.12	2.49/5.00	2.24/4.86	1.99/4.71	1.96/4.13	1.94/3.55	1.30/2.54	0.67/1.54	0.44/1.12	0.18/0.69	0.09/0.37
Seattle	3.82/5.60	4.00/5.74	4.17/5.89	4.14/5.57	4.12/5.25	3.34/4.92	2.55/4.60	2.18/4.02	1.81/3.43	1.72/3.16	1.64/2.90	1.53/2.45	1.42/2.00	1.09/1.86

MEAN TEMPERATURE RANGE FOR 20 CITIES, IN DEGREES F.

Table shows range observed 25% of time. Mean temperature higher 37.5% of time, lower 37.5% of time.
Computed by U. S. Weather Bureau (based on historical records of actual temperature)

City	Nov.	Mid. Nov.-Mid. Dec.	Dec.	Mid. Dec.-Mid. Jan.	Jan.	Mid. Jan.-Mid. Feb.	February	Mid. Feb.-Mid. Mar.	March	Mid. Mar.-Mid. Apr.	April	Mid. Apr.-Mid. May	May	Mid. May-Mid. June
Atlanta	76.9/78.5	46.6/48.4	44.0/46.0	43.3/45.3	43.5/45.5	44.0/46.4	45.1/47.9	47.5/50.1	51.2/53.6	55.9/58.0	60.9/62.6	64.9/66.5	69.0/70.5	73.5/74.6
Baltimore	45.6/47.0	40.2/42.0	35.8/37.8	32.2/36.1	33.9/35.7	33.4/36.0	34.6/38.0	38.1/41.7	42.0/45.7	46.6/49.4	51.9/53.6	57.5/59.0	63.4/64.6	68.2/69.5
Birmingham	50.7/53.2	46.5/48.9	44.3/46.5	43.4/46.1	43.5/46.5	44.4/47.6	46.0/49.4	48.8/5.17	52.4/54.7	56.6/58.5	61.1/62.6	64.6/66.3	68.4/70.2	72.4/74.5
Boston	43.6/45.6	36.8/39.2	31.2/34.0	28.9/31.9	27.9/31.2	28.4/29.6	27.8/30.0	31.4/34.0	35.6/38.6	41.1/43.3	46.7/48.3	51.5/53.1	56.7/58.4	56.8/58.6
Chicago	38.6/41.5	31.2/35.0	25.7/30.3	23.7/28.5	23.2/28.1	23.1/28.1	24.7/30.0	29.2/34.2	34.6/39.1	40.9/43.8	47.5/48.8	52.7/54.7	57.9/60.5	63.1/66.1
Cincinnati	42.0/44.5	35.9/39.1	31.4/35.2	30.1/34.4	29.8/34.6	29.9/34.4	31.6/36.0	35.2/39.2	39.6/43.1	45.4/48.1	51.4/53.3	56.4/58.6	61.5/64.0	66.7/68.9
Cleveland	40.5/42.7	34.3/37.2	29.3/32.9	27.3/30.9	26.9/30.5	26.0/29.6	26.2/29.7	29.8/33.7	34.7/38.8	40.3/43.2	46.2/47.8	51.8/53.9	57.9/60.3	63.5/65.7
Dallas	54.3/56.7	49.9/52.3	47.0/49.3	44.8/47.1	44.1/47.5	45.8/49.2	48.8/52.2	51.9/55.6	55.5/59.6	60.1/63.7	64.2/67.3	68.4/71.1	72.8/75.0	77.2/78.8
Denver	38.0/41.4	33.5/36.7	30.5/33.5	28.3/31.4	27.0/30.0	27.9/31.5	30.5/34.7	33.1/36.8	35.9/39.1	40.4/43.2	46.3/48.6	51.1/53.4	56.2/57.4	60.0/62.1
Detroit	39.2/42.1	32.9/38.3	27.9/30.9	25.0/28.5	24.8/27.7	24.2/27.8	24.6/28.9	27.9/32.1	33.1/37.2	39.3/42.1	45.6/47.1	51.0/52.8	56.5/58.7	62.3/64.4
Kansas City	42.6/45.9	36.7/40.1	32.4/35.9	30.4/33.0	30.0/31.9	30.2/33.6	32.2/37.1	37.3/41.2	42.9/45.9	48.6/51.3	54.9/56.7	59.9/61.7	64.6/66.4	69.4/71.2
Los Angeles	57.9/59.8	56.5/58.2	54.9/56.5	53.4/54.8	52.7/54.0	52.6/54.3	52.9/55.1	54.1/56.3	55.4/57.4	56.6/58.4	58.1/59.7	59.8/61.3	61.4/62.8	62.5/64.0
Minneapolis	30.9/36.0	22.5/28.1	16.2/22.3	13.8/18.4	13.4/16.5	13.3/17.7	15.0/20.8	21.7/25.9	29.9/32.5	37.3/40.3	44.7/47.9	51.3/53.4	57.2/60.2	62.2/64.9
New Orleans	59.0/61.9	56.6/58.8	54.6/56.8	53.2/56.0	52.6/56.0	54.0/54.4	55.9/59.3	57.6/60.8	60.6/63.0	63.4/65.7	67.4/69.1	70.7/72.1	73.8/74.9	77.0/78.1
New York	46.5/47.9	40.2/42.3	34.6/37.5	32.5/35.2	32.0/34.6	30.9/33.6	30.9/33.6	34.1/36.8	38.7/41.3	43.6/46.0	49.0/51.0	54.6/56.3	60.6/62.1	65.9/67.5
Philadelphia	45.3/47.2	39.5/42.0	35.1/37.3	32.7/35.4	31.8/35.0	31.1/34.3	32.3/35.3	36.4/39.2	40.8/43.5	45.6/47.9	50.8/52.6	56.2/58.0	62.3/64.0	67.5/69.2
Pittsburgh	40.3/42.0	34.0/36.4	29.5/32.6	27.8/31.0	26.9/30.1	26.4/30.5	26.9/32.0	30.5/35.4	36.0/40.6	43.3/46.5	48.0/49.8	53.1/55.1	58.7/60.9	63.5/65.8
St. Louis	43.6/46.9	37.6/41.2	33.3/37.1	30.9/35.1	30.1/34.7	31.3/35.7	33.7/38.1	37.8/41.8	42.9/46.3	48.6/51.5	54.5/57.0	58.4/61.9	64.0/66.6	68.7/71.5
San Francisco	53.8/55.0	50.9/52.3	48.7/50.2	47.1/48.9	46.9/49.1	48.3/50.8	50.0/51.7	51.0/52.8	51.7/53.5	52.4/54.2	53.2/55.0	54.3/55.9	55.9/57.4	57.5/59.1
Seattle	43.1/44.5	41.0/42.4	39.4/40.7	37.7/39.0	37.2/38.5	38.2/40.0	39.7/42.0	41.7/43.3	43.6/44.7	45.8/47.2	48.2/49.9	51.0/52.9	54.2/56.3	56.9/58.5

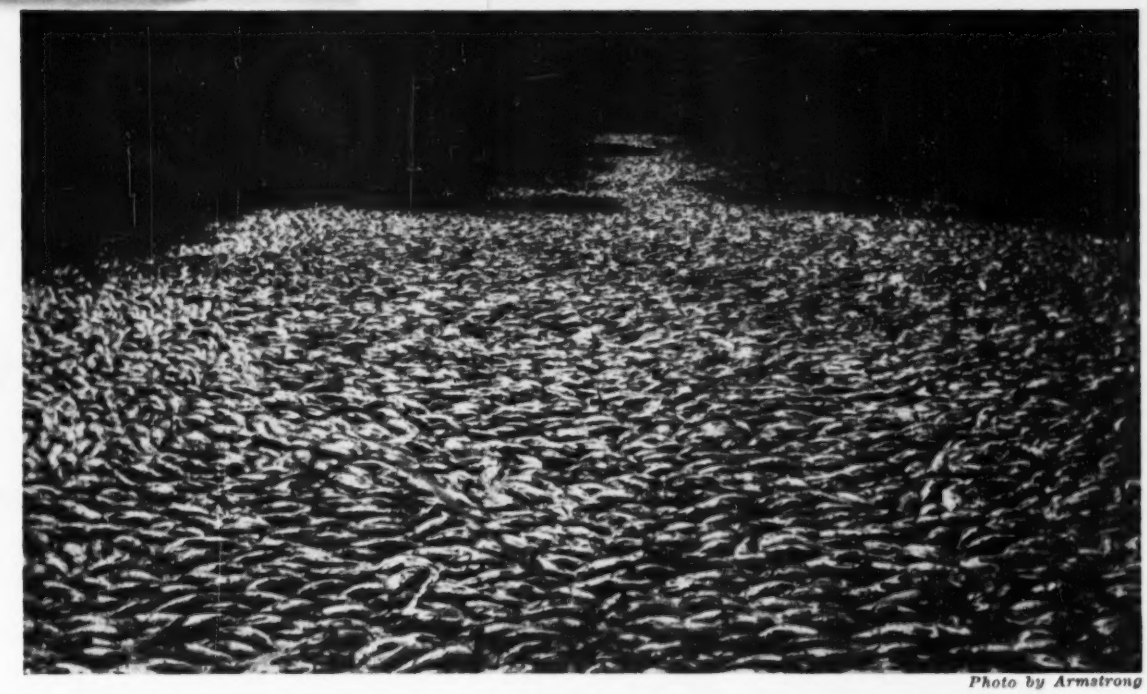


Photo by Armstrong

What killed these carp on the Kalamazoo?

"Four acres of carp corpses" (above) made Picture of the Week in LIFE magazine a few weeks ago. And while LIFE may not have given a technically perfect explanation for the fish kill, the impressive picture story had real impact on pollution abatement progress along Michigan's Kalamazoo River.

According to Milton P. Adams, executive-secretary of Michigan's Water Resources Commission, the hardy carp did not die, as LIFE reported, "of an entirely new cause—starvation," but a familiar old bugaboo—oxygen depletion.

The important thing here, as far as Mr. Adams and others interested in pollution abatement are concerned, is that LIFE's millions of readers were given a graphic and readily understandable picture of an extreme effect of stream pollution.

Here are additional facts:

Zero dissolved oxygen was found in 40 miles of the Kalamazoo River above Allegan on Sept. 3 and 4. In the same section biochemical oxygen demand of the stream ranged up to 50 ppm at certain stations while hydrogen sulfide determinations from water samples were as high as 2.5 ppm.

During the following ten days a progressive killing of the carp continued in Allegan Lake. This condition extended down to the municipal dam located five miles below Allegan as water of the excessively polluted stream displaced the fresher waters of the impoundment.

Fish killing was immediately preceded and accompanied by hydrogen sulfide odor complaints and recorded discoloration of household silverware in Otsego, plus visible damage to exterior paint on houses near the river at Cooper, Plainwell, Otsego and Allegan.

Prolonged hot weather and lower than usual August and September stream flows in the Kalamazoo River, coupled with untreated sewage and industrial wastes and previously deposited sludge loadings, accounted for this unprecedented occurrence.

Orders had been adopted by the State Water Resources Commission in 1951, calling for sewage treatment and substantial reduction in industrial waste loadings by eleven mills that use the river from Kalamazoo to Otsego for waste disposal. Compliance dates ranged from 1953 to 1955.

Total loadings on the river at the time of the recent catastrophe was estimated to be about 5 percent less than that imposed at the time of surveys made in 1950.

LIFE's statement that "stepping up" of production by the paper mills caused the oxygen depletion that resulted in death of the carp is not in accord with the facts, according to Michigan engineers.

The pulp mill wastes of one lower-river mill are now being given further attention by the commission with the prospect that additional restrictions will be placed soon on the largest dissolved BOD loading in the valley.

Reactions to the fish kill and the hydrogen sulfide fumes and the attendant publicity were fast and positive. Citizens were aroused to the point of demanding immediate legal action. Others have counseled against such action. In any event many doubts as to the need of meeting previously established commission requirements have been dispelled by the killing of the carp.

Thinner runway edges?

It may be possible to economize in building airport runways by making the edges of the pavement thinner, suggests the Institute of Transportation and Traffic Engineering of the University of California.

The institute tested 750 landings and take-offs at Oakland, San Francisco and Los Angeles Airports to determine how much use is made of portions of the runway to the right or left of center.

If analysis of the observations shows that the edges of runways don't get much wear, future runways can be built with thinner edges, substantially reducing cost of materials, according to Robert Horonjeff and John Hugh Jones, Institute staff members who are supervising the tests.

MACOMBER

STANDARDIZED STEEL BUILDING PRODUCTS AND THE ADVANCED ENGINEERING OF EACH PRODUCT HAVE MADE THE NAME MACOMBER

a Tradition among Architects and Builders

How You Benefit From STANDARDIZATION

No. 1 ANY MACOMBER PRODUCT YOU SPECIFY has been accurately engineered to the best ratio of weight to load carrying capacity.

No. 2 Since all Macomber products can be specified by a symbol, number or names—the basic engineering has already been done. YOUR item is cataloged—ready to be produced for a given span, load, height.

No. 3 When STANDARDIZATION replaces individual engineering of each product with line production, you gain in delivery time, production cost and the absolute uniformity of day in and day out quantity production of the same item.

For a bid that will win—SPECIFY MACOMBER. No name has more universal acceptance in Engineered Construction!

ORIGINATORS OF THE *OPEN WEB STEEL JOIST*

STANDARDIZED STEEL
V BAR JOISTS • LONGSPANS

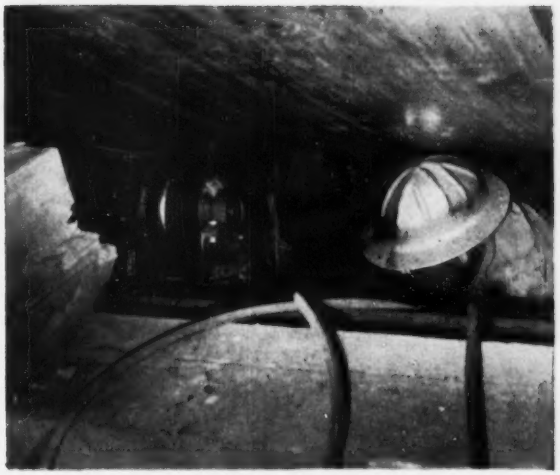
BUILDING PRODUCTS
STEEL TRUSSES • STEEL DECK

MACOMBER INCORPORATED

CANTON 1, OHIO

• ENGINEERING • FABRICATING AND ERECTING •

SUBMERGED WELDING MACHINE welds 26-ft dia tunnel liners for Palisades Dam. Welding is backed up as . . .



UNDERNEATH THE STEEL SHELLS rollers position belt conveyor that carries welding flux. This is key to backup.

Automatic welding goes into the field to assemble tunnel-lining sections

Steel liners for tunnels at Palisades Dam in Idaho are being fabricated by a welding process that is new to field work. The ¾-in. steel plate is assembled into 26-ft dia sections 40-ft long, using a submerged-arc automatic welding process with pressure backup. The pressure backup part is new.

Specifications for the welding work require that the circumferential joints include either double or single welded butt welds with backing strips on the outside. The pressure backup system eliminates the necessity of a backup strip or of welding from both sides.

This method—known technically as submerged melt automatic shielded arc with controlled pressure melt backup—has been used extensively in shop work, but has not been subjected to the varying conditions of field fabrication. The effect of weather changes and training field crews in complicated automatic welding processes have been major problems.

Basic element in the process is a standard submerged arc unit that works inside the liner. Granular welding flux is held against the joint on the outside to form the pressure backup.

Getting the flux material to the proper place in the proper quantities is no simple trick: It must be fed continuously to the underside of the large diameter units, by a conveyor belt system. Rollers, bearing against the shell, maintain the proper contact of flux with metal. And a workman using a vacuum device in the relatively narrow space under the large assembly gathers used and excess flux for reclaiming and reuse.

Steel plate is delivered to Palisades in 120-deg. arcs rolled to shape. Width is either 8 or 10 ft. Three of these units are tack-welded to form a cylinder. Then stiffener rings (6x⅞ in. spaced not more than 5 ft apart) are tack-welded on. A spider is attached inside the pipe at each stiffener ring. Next, the sections are rotated while the stiffener is continuously welded on.

Longitudinal welds are made with a pressure backup system similar to that employed for the girth welds. After the longitudinal welds are completed and the stiffeners mounted, the section is tack-welded to another section or sections. This is followed by the continuous circumferential welding. Other units are added until the 40-ft length has been completed.

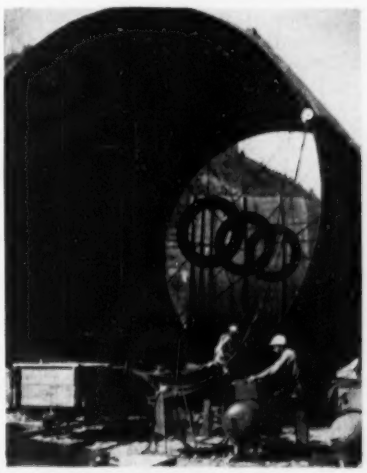
Only the last 728 ft (a little more than half) of the dam's power and outlet tunnels will be steel-lined. A 28 ft dia spillway tunnel will have no lining.

Below the lined section of the outlet tunnel there will be an outlet manifold. And at the end of the power tunnel will be a penstock and powerhouse by-pass assembly. Both of these will be fabricated of heavy steel plate. But similar fabrication methods will be followed.

The difference is that this metal varies in thickness from 1 1/16 to 1⅛ in. And all of this heavy material must be stress-relieved and radiograph inspected. Facilities are being installed for such work at the present time.

• **Haulage unit**—The tunnel liner assembly work is also noteworthy for

WORKMAN CHECKS HOPPER to see if weld flux being fed to underside of liner assembly is in adequate supply.



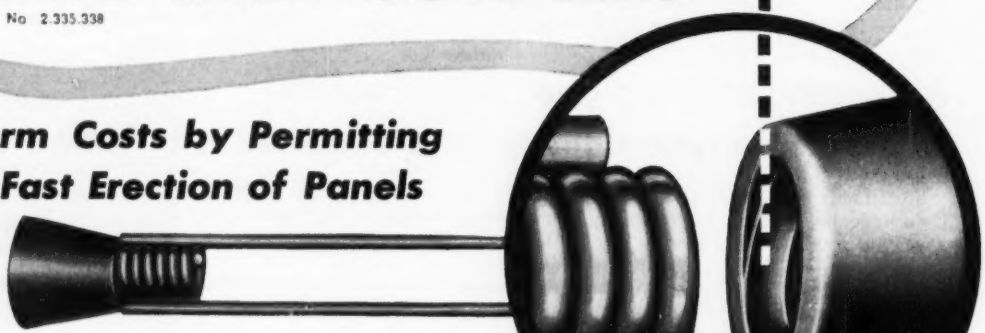
SPIDER LEGS holding pipe are unscrewed to pass over welding machine as huge units are slowly rotated.

NEW!

THREADED CONES * for SUPERIOR CONE-FAST COIL TIES

Pat No 2,335,338

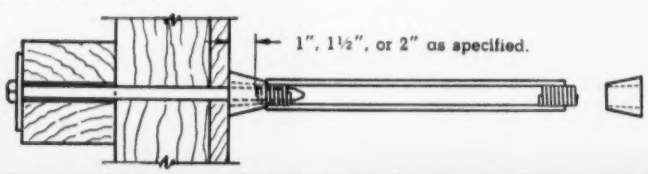
Cuts Form Costs by Permitting Extra Fast Erection of Panels

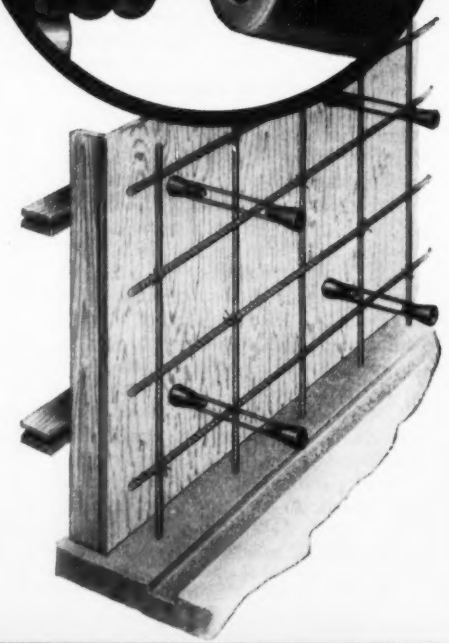


A direct way to cut forming costs is to use new Superior *Threaded* Coil Cones with Cone-Fast Coil Ties. Where cones have to be dependably held in place, *Threaded* Coil Cones are practically a "must".

Previously, Coil Cones were held onto the extended coils by friction alone. Now, a couple of threads in the cone fix Coil Cones securely to the Coil Ties. Here's another advantage . . . units can be bench assembled with the assurance that they will arrive at the installation point intact! *Threaded* Coil Cones cannot be knocked off the Coil Ties when the opposing form is being applied. When unscrewed with a cone wrench, the threaded Coil Cones automatically back themselves out of the wall.

Cone-Fast Coil Ties with threaded Coil Cones are supplied for ½" to 1¼" Coil Bolts, with safe load capacities from 5,000 lbs. to 36,000 lbs. Working parts (cones and bolts) are returnable for credit.





SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

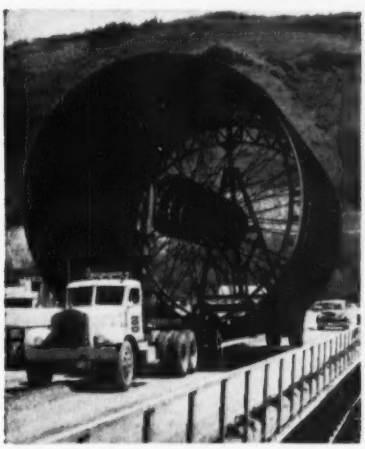
New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

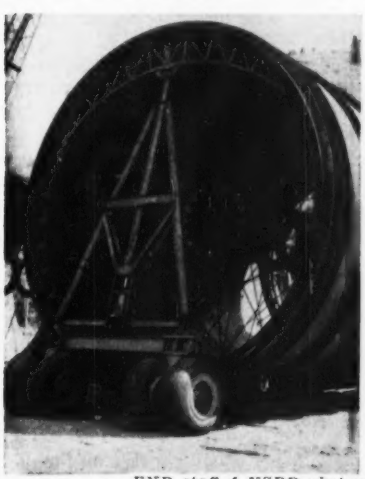
a hauling arrangement that moves the heavy sections from the fabrication area to the tunnel portal. This involves a truck unit and a rear dolly unit each of which has a circular frame that is jacked into the end of the assembly. The jacking pressure holds the frames fast as the units make the ¾-mile trip.

Prime contract for work at Palisades Dam is held by Palisades Contractors, Inc. Subcontractor for plate steel assembly is American Pipe and Construction Co. with Robert Low heading the field work.

Palisades Dam, a U. S. Bureau of Reclamation project, is on the south fork of the Snake River, in eastern Idaho. Louis B. Ackerman is construction engineer for USBR.



COMPLETED SECTION is hauled from field fabricating yard to tunnel by special unit that uses the 40-ft-long steel liner as a trailer. Truss arcs are part of hauling assembly. Spiders are left inside liner until concrete backing is completed.



ENR staff & USBR photos

REAR DOLLY of hauling unit has jack in frame to hold the assembly fast to tunnel liner. Main joints of assembly are pin connected.

SKEWED-ARCH FRAMING forms a diamond pattern over a new municipal auditorium in Corpus Christi, Tex. Open-web purlins span between the main members.

Steel lamella supports long-span roof

In only 25 working days, 260 tons of steel covering 65,000 sq ft were erected for the arched roof of the Municipal Civic Auditorium in Corpus Christi, Tex. Springing from concrete buttresses along the sides of the building, the main members, circular steel arches, span 224 ft with a rise of 30 ft, providing a 42-ft clear height at midspan.

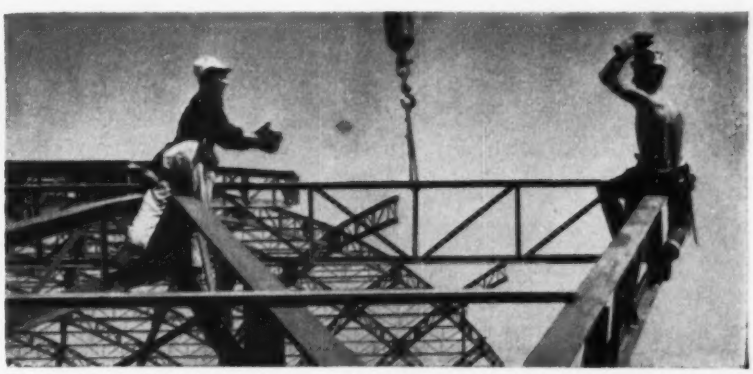
The construction, though not new, is unusual. Known as lamella construction, it was introduced into this country about 1925. Main members span between supports on a skew, the areas included between intersecting members being diamond shaped. In the past, the framing also has been made of wood or reinforced concrete.

Fabrication of the auditorium roof framing was simplified by making lamella units identical, but right and left hand. Erection also was simplified because only two types of purlins were required. Falsework was necessary only to erect the first few members; after that, members were erected with a crane.

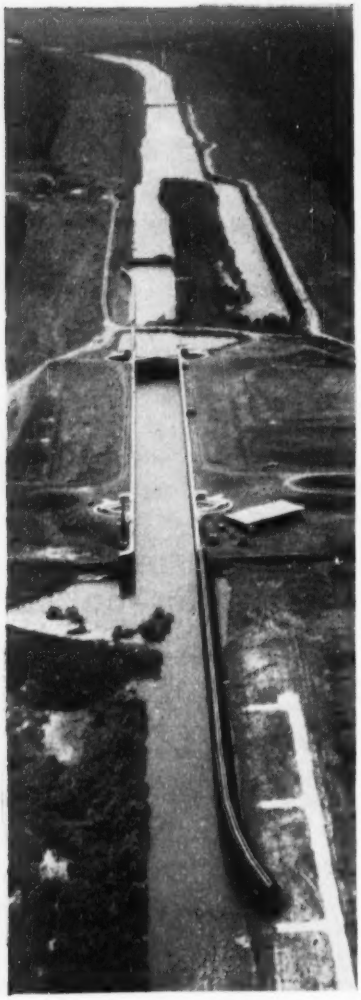
Arches and purlins are open-web members, 24 in. deep (span-depth ratio of 112). Main and intermediate purlins, spaced about 6 ft apart, will support a welded metal deck insulation and built-up roofing. High-tensile bolts were used to erect the arches; otherwise the framing is all-welded.

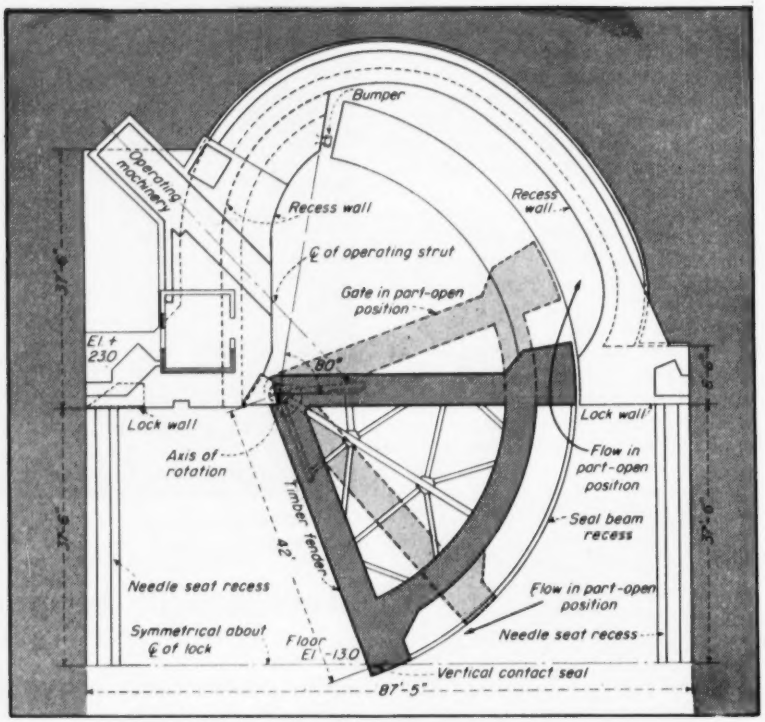
Roof Structures of Texas, with offices at Austin and Houston, holds the contract for the auditorium roof. Design and details were prepared by G. R. Kiewitt and Hale and Harvie —all of St. Louis, Mo. The lamella units were fabricated by Columbia Iron Works, St. Louis, and the purlins, by Tips Engine Works, Austin. Gulf Erection Co., of Houston, Tex., erected the steel.

Richard S. Colley is the architect, and Walsh Construction Co., the general contractor—both of Corpus Christi.



CANTILEVERING from buttresses, arches were erected without falsework.





SECTOR GATES of an improved design were built for Algiers lock. The design is based on a type originating in Sweden, but unlike the Swedish gate, the water going around the gate leaves enters the chamber back of the pintles. By passing about two-thirds of the water through the recesses, turbulence in the chamber is much less than when all water passes between the gate leaves, and the filling time is reduced.

Improved lock gate design reduces filling turbulence

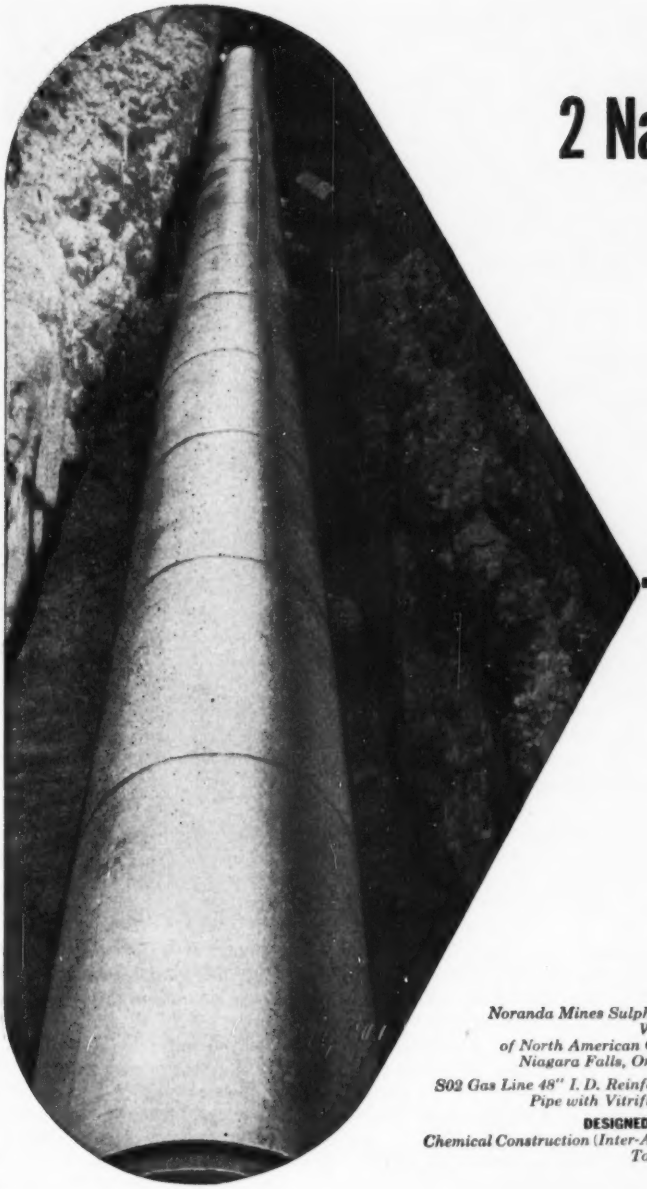
ALGIERS LOCK on a new canal connecting the Mississippi River with the Intracoastal Waterway southwest of New Orleans.

A material reduction in turbulence within the lock chamber has been obtained at the new Algiers lock on the Intracoastal Waterway near New Orleans, through an improved design for the sector gates of that structure. Operating characteristics of the lock also have been improved.

Algiers lock is located on a new canal being built to the west of the Mississippi River below New Orleans to provide an additional connection with the Intracoastal Waterway. Traffic on the waterway has increased from an estimated 5 million tons in 1925, when modernization of the waterway was authorized, to 35.5 million tons in 1952. Traffic now moving from the waterway into the Mississippi passes through Harvey lock opposite New Orleans.

The new canal branches off the present channel about six miles south of the Harvey lock and extends northeast to the river, a distance of nine miles.

Algiers lock is set back some 2,000 ft from the river to provide an ade-



2 Names you can Trust

1 UNIVERSAL
for Vitrified Clay Pipe

2 UNITED STATES
for Concrete Pipe

Our many years of experience and know-how assure uniform product quality and dependability.

Our service is unbiassed because we make both vitrified and concrete pipe. Our only interest is to deliver the right product for the job.

Delivery promises are kept. Prompt shipment is assured with 8 plants strategically located.

Our prices reflect the efficiency and economy of modern mechanized manufacturing equipment and methods.

Noranda Mines Sulphur-Iron Plant, Welland Works of North American Cyanamid Ltd. Niagara Falls, Ontario, Canada

S02 Gas Line 48" I. D. Reinforced Concrete Pipe with Vitrified Clay Liner.

DESIGNED AND BUILT BY
Chemical Construction (Inter-American) Ltd., Toronto, Canada

PRODUCTS

Sewer Pipe (Vitrified)	Slipseal Sewer Joint	Flue Lining
Sewer Pipe (Concrete)	Segment Sewer Block	Stove Pipe
Vitrified Liner Plates	Meter Boxes	Chimney Tops
Tylox Flexible Rubber Coupled Vitrified Pipe	Ship Lap Wall Coping	Chimney Pots
Aerodrane Filter Block	Septic Tanks	Fire Brick
	Drain Tile	Fire Clay

Vitrified Clay Plate Lined Concrete Pipe

SALES OFFICES:

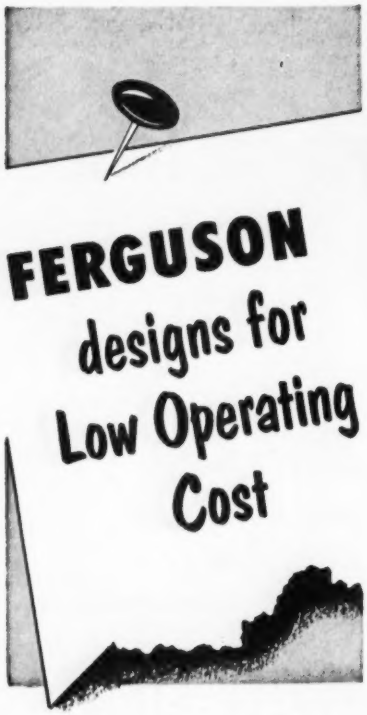
BALTIMORE, MD.—HALETHORPE BRANCH—Box 7769. Tel. Elkridge 790
PHILADELPHIA, PA.—P. O. Box 30, BRISTOL, PA. Tel. Bristol 5571
Tel. Enterprise 6015
CINCINNATI, OHIO—P. O. NEWTOWN, OHIO—Box 215. Tel. Locust 7846

FACTORIES:

BALTIMORE, MD., CINCINNATI, OHIO, NEW PHILADELPHIA, OHIO,
PALMYRA, OHIO (2), PHILADELPHIA, PA., UHRICHSVILLE, OHIO (2)

UNIVERSAL SEWER PIPE CORPORATION
UNITED STATES CONCRETE PIPE CO.

• *GENERAL OFFICES* • 1500 Union Commerce Building • CLEVELAND 14, OHIO



• Ferguson architects and engineers concentrate on operating cost for the owner. Every element of plant design provides for the most modern and efficient equipment that will assure automatic, round-the-clock operation ...more production at less cost.

Low initial cost is accomplished by bold design simplifications and pre-planned, well-organized construction operations. A work planning group supervises all operations to guarantee owners the most value for their expansion dollar.

We would like to explain the Ferguson manner of operation to you in detail. Our cost-cutting planning methods can be profitable to you in your expansion program.

THE H·K·FERGUSON COMPANY
ENGINEERS AND BUILDERS

EXECUTIVE OFFICES: Ferguson Bldg., Cleveland • NEW YORK OFFICE: 19 Rector St. • HOUSTON OFFICE: 2620 S. Main St. • CHICAGO OFFICE: 1 N. LaSalle Bldg. • LOS ANGELES OFFICE: 411 West 5th St. • CINCINNATI OFFICE: 826 Enquirer Bldg. • SAN FRANCISCO OFFICE: 74 New Montgomery St. • ATLANTA OFFICE: 86 Forsyth St.

ENERGY IS DISSIPATED HARMLESSLY back of a partly open gate as water passing through the recess for one gate leaf meets water from the opposite side head-on at the center of the lock.

quate approach channel for tows waiting to get into the lock from the river.

The lock chamber is 75 ft wide and 800 ft long, with a usable length of 760 ft. Its floor is 13 ft below mean-low Gulf level and the top of the wall is 23 ft above that level.

Purpose of the lock is to permit barge traffic to enter or leave the river at all stages, which range from one-half foot below the mean low on the Gulf gage to 18 ft above it.

At times the gates will have to be operated under a reverse head of as much as 5 ft. This is due to the fact that heavy rains come in the region crossed by the waterway when the Mississippi is at or below mean-low Gulf level. That was one of the chief reasons for using sector gates for the lock, as they can be operated under a reverse head. The other main reason was a considerable saving in cost, as filling and emptying passages in lock walls or floor are not required.

However, high turbulence in the lock chamber, with possible damage to shipping, has been a characteristic of the sector-type gate as compared to a lock with mitre gates and filling passages. In designing the Algiers lock an effort was made to reduce turbulence. This was done by enlarging the area between the face of the gate and the recess wall when the gate is in part-open position and by setting the gate face back from the ends of the frames forming the sides of the gate. As a result, when the gate is being opened, the gate only needs to rotate through a small angle before there is a large opening to permit water to flow into and through the gate recess. This is shown in the drawing on the preceding page.

At the supporting end of the gate, the pintle is set some distance out from the recess wall. That permits water to pass into the lock chamber without impinging on the gate frame.

The shape of the gate is such as will reduce the opening torque as far as possible.

According to the present construction schedule, the canal will be opened to navigation in 1955.

The project was designed and is being constructed by the New Orleans District of the Corps of Engineers under Colonel Charles T. Tench, district engineer. The work is under the supervision of Fernando Estopinal, field assistant in charge of the Pointe-a-la-Hache territory of the New Orleans district.

Fabrication and installation of sector gates were under contract with Consolidated Western Steel Corporation, Houston, Tex. Excavation of navigation canal was under contract with Jones & Buchanan, Baton Rouge, La.

IMPROVED VIEW of their handsome state capitol is now available to residents of St. Paul, Minn.

Improvements ok'd

St. Paul launches decade of public construction

The "new look" about St. Paul, Minn., will go far beyond the "face-lifting" of the approach to the State Capitol grounds.

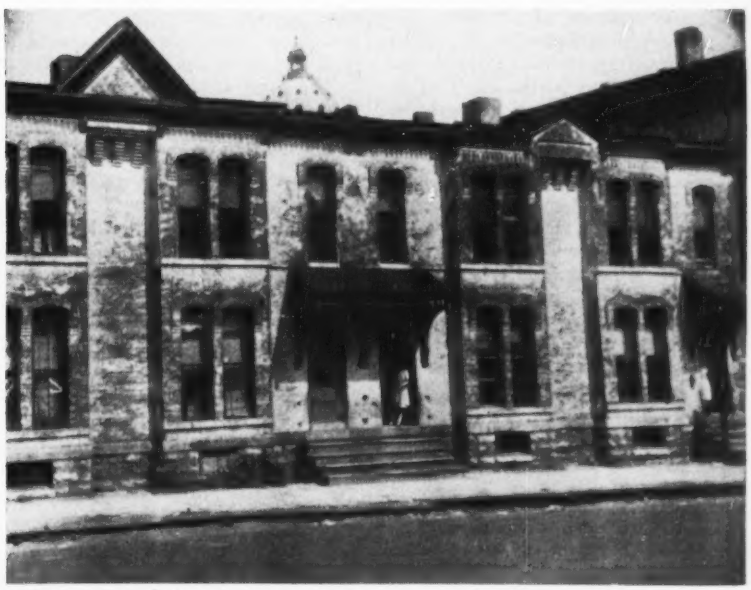
Voters on Nov. 3 overwhelmingly endorsed the adoption of a $39-million bond issue (ENR Nov. 12, p. 21) that was hailed by officials as the opening gun for the "greatest decade of the city's history."

The public improvements program was recommended by the city's second United Improvement Council in a report to Mayor John E. Daubney.

The capital improvements will include public works, schools, public safety, parks and playgrounds, public utilities, libraries, a municipal auditorium, civic education center and a civic athletic and recreation center.

The preliminary step toward a new St. Paul was taken in 1945 with the extensive program of slum clearance and landscaping that wound up early this year with a newly refurbished 75-acre approach to the capitol building touted by state and municipal officials as second to none in the country for beauty.

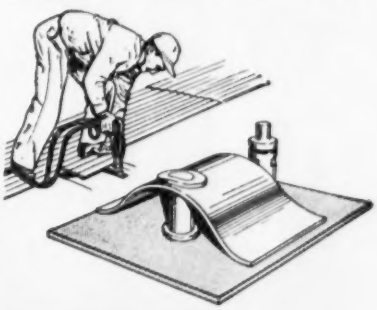
• **Sound financial planning**—The city, whose borrowing limit is established by



MORE TO BE DONE—More dilapidated structures like this one will fall to wreckers under next phase of improvement program.

FASTEN IT BETTER... AT LESS COST... WITH NELWELD

FOR EXAMPLE...
CORRUGATED METAL ROOFING AND SIDING



ONE SIDE APPLICATION
FINE APPEARANCE GREATER STRENGTH
LOWER INSTALLATION COST

Nelson construction fasteners are distributed by United States Steel Supply Co., Reynolds Metals Co., Aluminum Company of America, Johns-Manville, Philip Carey Mfg. Co., Armstrong Cork Co., Southern States Iron Roofing Co.

NELWELD
NELSON STUD WELDING
DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

Imported CASTELL
lays it on the line
• SMOOTHER—no hard spots.
• GRAPHITE-SATURATED—better adhesion.
• MORE OPAQUE — better blue and white prints.
• STRONGER—less point breaking.
• NON-BLEEDING — gives more prints — cleaner and sharper prints—even after hundreds of trips through the reproducing machine.
• ECONOMICAL—25% to 33⅓% more wear.
CASTELL
the drawing pencil with the Master Degrees
A.W.FABER CASTELL LOCKTITE U.S.A. 2H
A.W.FABER CASTELL 9000 HB
Your choice of CASTELL 9000 wood-encased pencil or balanced Push Button LOCKTITE Holder. Black or colored.
Imported CASTELL 9000 and CASTELL 9030 Imported Leads —18 degrees —full range, 7B to 9H.
A.W. FABER-CASTELL PENCIL COMPANY INC.
*Imported from West Germany

law at 10% of the value of real and personal property, has not approached its limit in over 20 years. (The limit has risen steadily from $24 million in 1932 to more than $50 million in 1953, and the net bonded indebtedness has been reduced over the same period from $24 million to approximately $10 million.)

• **And its result**—The new bond issue, slated primarily for construction expenditures, will raise the debt close to the limit once more, but here's what the city will receive for it over a period of eight years:

• Public works—Construction, repair and maintenance of streets, bridges, truck routes and flood control, $12,400,000; sewer construction and rehabilitation, $8,116,000; garbage collection and disposal facilities, $125,000.

• Schools—New construction, rehabilitation, site acquisitions, $11,000,000

• Public safety—Fire and police department structures and equipment, $500,000; St. Paul's share for land and building of a health center, $200,000.

• Parks and playgrounds—$1,500,000.

• Public utilities—New installation and rehabilitation of street lighting, $750,000.

• Auditorium—Repairs and alterations, $350,000.

• Libraries—Construction and equipment, $315,000.

• Civic education center—Construction of center and alterations to a connecting auditorium, $1,700,000.

• Civil athletic and recreation center—Land and structure, $2,000,000.

Attorney Pierce Butler, Jr., chairman of the improvement council, said that on the basis of the city's valuation, the bond program, properly integrated with the city's debt retirement program, should result in a tax-rate increase of not more than 3.05 mills over present debt-charge levies, that figure will not be reached until 1971.

"Actually, if new building continues to increase as it has in recent years, or near that rate," Butler said, "it may well result in no increase in the tax rate.

"We don't say that it is possible to get something for nothing. Rather, to illustrate our meaning, we call attention to a combined school bond proposal and charter amendment submitted to the people of St. Paul in 1950. It was calculated that on the basis of then existing valuations the tax increase would not exceed six mills. The 1950 tax rate was 119.20 mills. Today the tax rate is 118 mills. It is actually less than in 1950."

The first United Improvement Council, which met after mayoral appointment in 1928, submitted the only previous program of any great scope. That program also passed by a large majority in a public vote.

Aluminum posts reduce costs

Residents of sections of New York City will soon notice a change in traffic signal posts. The new model, made of aluminum, will be used on new installations, for modernization of old installations and for maintenance replacements of the old style posts.

The old type posts were not readily adaptable for mounting modern adjustable models of traffic signals. They were made of 42 different parts, assembled before erection, and held together with two sets of steel rods subject to severe rusting. The cast iron model weighed 232 lb compared with the 60-lb weight of the new one.

The aluminum post, a one piece unit, requires no assembly. One man can handle it easily for installation.

Commissioner T. T. Wiley, of the city's Traffic Department estimates that the new posts, purchased at only 66% of the old post price, will save the city $45,000 per year.

City power dams cleared by second court decision

The city of Tacoma, Wash., has a valid license to construct two hydroelectric dams on the Cowlitz River, the Washington State Supreme Court ruled recently, giving the city its second legal victory in ten days. The state high court set aside a state law.

The Ninth Circuit Court of Appeals previously had ruled (ENR Nov. 5, p. 17) that it could not prevent construction of the $146-million project after its approval by the Federal Power Commission.

A 1949 law that set the river aside as a fish sanctuary is invalid, because federal laws giving the FPC jurisdiction over the stream supersede state laws, the supreme court declared in a majority opinion signed by six judges. Three judges of the body, in a minority opinion, upheld constitutionality of the sanctuary law, describing the city as a creature of the state and thus subject to prohibitions by the state legislature.

• **Point in doubt**—The court left one point undecided—determination of the validity of a bond issue the city has proposed for financing the project. This point must be determined by the

Thurston County Superior Court, where Judge Richard Wright earlier ruled against the city in its test case against the State Fisheries Department and taxpayers representing the fishing interests.

Sportsmen's groups and the state departments of fisheries and game contend that the dams would destroy the last good salmon spawning area in the state.

"It is the FPC rather than the fisheries and game directors of this state who have the right to protect fish on behalf of the people of the state and nation," said the majority in their opinion.

The project calls for two dams at Mayfield and Mossyrock, 185 ft. and 325 ft. high, respectively, to generate an estimated 345,000 kw.

J. Frank Ward, superintendent of Tacoma City Light Co., expressed himself as "very much heartened" by the latest court decision, but Gerritt Van derEnde, chairman of the recently-created Tacoma Public Utilities Board, said that in view of increased costs the entire project would have to be re-examined.

Park-O-Mat claims success after 22 months in operation

From Washington, D. C., comes a report on the success of the Park-O-Mat Parking garage—claimed to be the only completely automatic unit for that purpose in the world.

Leon F. Lamb, vice-president of Parking Services, Inc., which operates the 18-story Park-O-Mat, has tendered a report covering the 22 months of its operation, and cites some figures to illustrate its progress.

So far this year, the push-button garage has averaged about 200 cars per day—last year the average was 135 cars.

• **Gross income** for this fiscal year will approximate $43,000, and with only one attendant the major overhead is depreciation and taxes. Cost of the building and land was approximately $300,000 when acquired in 1951.

The building is only 25 ft wide and 63 ft deep, but it rises to a height of 130 ft and contains two underground levels. Two high-speed, doorless elevators carry the autos—minus drivers—to the desired floor and park them automatically. It is claimed that the average time of parking or delivery is 50 seconds, but a car on the second floor can be delivered in as short a time as 28 seconds.

Twin Disc Torque Converters in

First Legal* 45 ton Hi-Way Cranes

Twin Disc Torque Converters are incorporated in the new 45-ton trailer-mounted Hi-Way Crane developed by Osgood-General, in conjunction with Talbert Construction Equipment Company.

Adding a new and versatile tool to the construction industry's and heavy rigger's equipment list, the new crane will lift 45 tons and handle up to 145 feet of boom and jib . . . and will meet highway load restrictions in the various states.

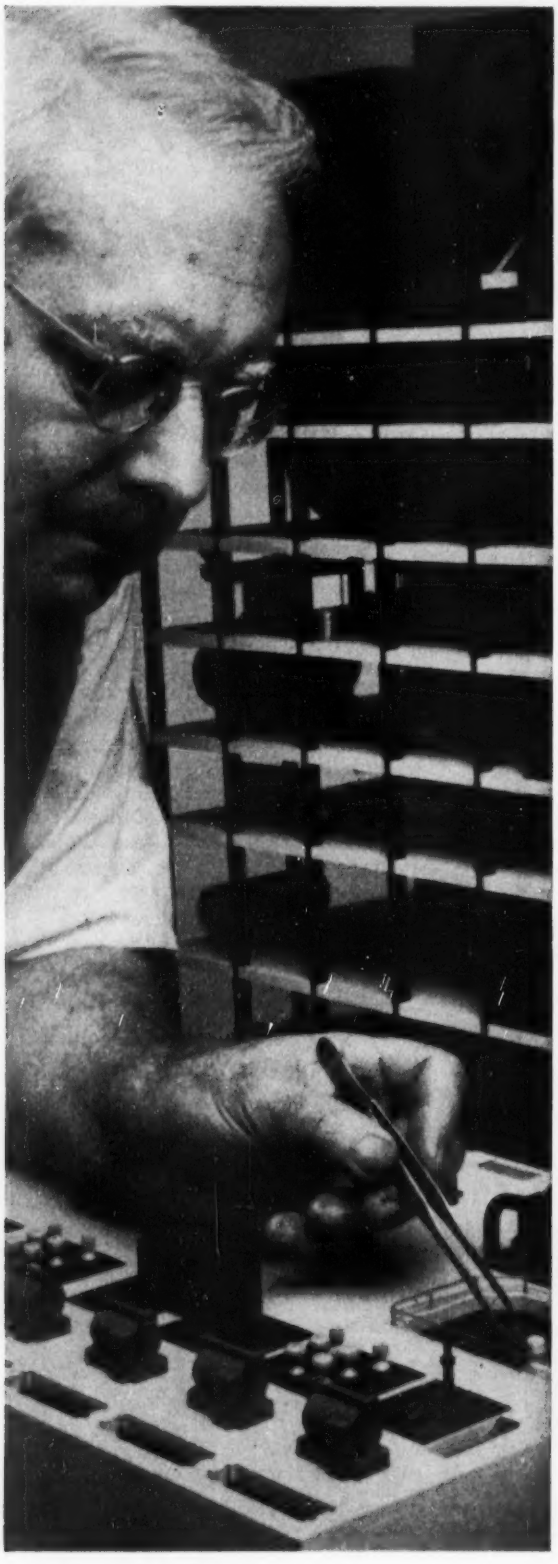
Torque converter operation enables the crane to lift and handle heavy and awkward-shaped loads to great heights with smooth and accurate control, permitting delicate inching and hovering of loads.

*Legal on Highways of nearly every state, with permit.

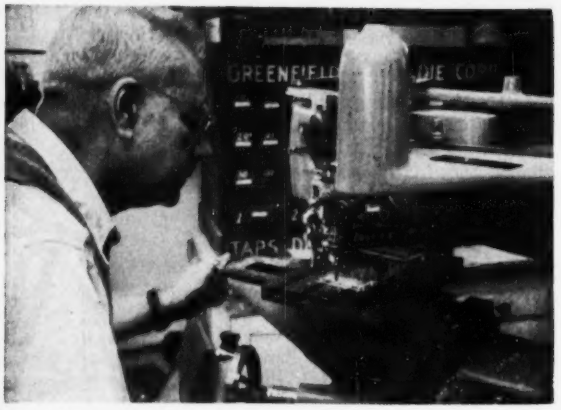
TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

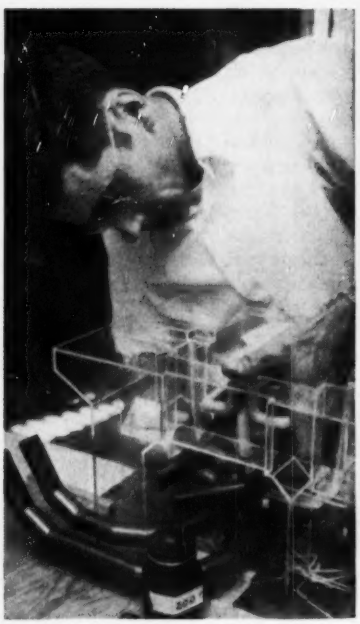
BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

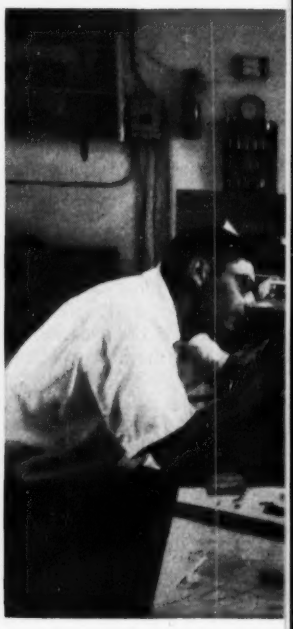


Model making starts with a drawing



Precision parts are turned out . . .





then carefully assembled

Henry Soper: His small-scale models solve big problems for power plants

checked and rechecked . . .

ENR photos by Compton

by Henry Soper and Sons.

Opposite his Woodbury, Conn., colonial home, in a 40 x 26 ft. two-story frame shop, Henry F. Soper is busy building power plants. Property owners, municipal officials, contractors raise no outcry. For the plants are are plastic "preproductions"—small-scale models used by utility companies and engineers to see how their plans shape up.

Since accuracy to the thousandth of an inch is demanded, model building is done almost entirely by machine. Soper's plant is equipped with precision tools for drilling, turning and routing. Jigs make it possible to fashion hundreds of duplicate parts.

It's such equipment that permitted the representation of 20,000 windows for one of Soper's assignments—an exact model of a steam power station in India's Damodar Valley. The model, 11½ in. long, was made for presentation to Prime Minister Nehru.

When Soper started the model-building business (Woodcote Associates)—back in 1946—a chicken coop next to his house served as a shop. It was only a part time operation. Soper, an engineer, was still active in business as an industrial executive.

Then Soper began to think about the future of his two sons—both engineers. Taxes would shrink an estate but if the boys were established in business they would be left with a steady source of income. Soper concentrated attention on the skills of his sons, built the firm around them, added his own executive and engineering knowledge.

• **The fledgling firm**—Early orders were comparatively simple. One of the first assignments of the fledgling firm came from a national magazine devoted to home planning and construction. It had developed a series of five house plans and wanted to illustrate them in an article. But at the time housing materials were scarce; if obtainable, they were expensive. The editors wanted to be certain that the plans were workable. Scale models could provide the answer.

So Soper and his sons built the house models, complete with furnishings and removable roofs. The models proved that the plans were correct. Photographs were taken to show how the houses would appear when built.

Next came an order for a church. This wood model, only 14 x 10 in., was illuminated to display celluloid stained glass windows handpainted in color and complete in detail down to the last angel.

All of the first models were constructed of wood. But when the firm switched its emphasis from houses and churches to power plants, a more versatile material was needed. The answer: acrylic plastic.

Orders became more complicated; new methods of model construction had to be found. Soper's engineering training, his business experience (head of a plastics firm, paint manufacturing company, machine tool concern), provided the background to develop special construction and paint application processes.

Today Woodcote Associates generally works on one to three major models at a time. The basic price is $5 an hour for each working man—plus materials and shipping costs. When the client is in a great rush additional help is hired. It is not easy for Soper to find assistants with the kind of skill he requires. Amateur model-makers who want to get into the profession rarely have the engineering background. And commercial model-makers have difficulty adjusting to Soper's methods and meeting the precise accuracy that is the all-important standard of his work.

• **Power plant program**—A complete model program for a steam generating plant calls for construction of three preproductions.

The first is a white block model, made from rough sketches agreed upon by the client and its engineering consultants. It is painted matte white so that changes can be marked with a pencil and seen by all involved in the conference of engineer and utility representatives. Since air freight is used for transport, this model rarely is more than 24 in. long and is scaled to 1/2 or 1/8 ins. to the foot.

The second model, prepared from general arrangement drawings, is painted full color and shows windows, doors, platforms and stairs. It usually has a base of 3 x 4 ft., a scale of 1/2 or 1/8; but sometimes it runs as small as 1/80 or as large as 1/4 in. to the foot.

The final or working model, prepared from blueprints, has transpar-

NEW SHAWNEE

HYDRAULIC ANGLE DOZER

IDEAL FOR FAST SNOW REMOVAL

ANGLES BY DOUBLE ACTING HYDRAULIC CYLINDER

Hydraulically controlled from driver's seat. UP, DOWN, ANGLE LEFT OR ANGLE RIGHT—eliminates dead-heading. Blade can be tilted approximately 20° by manual setting. Also, side shifting mold board permits back filling ditches with tractor operating on solid footing away from ditch. Zerk fitted. Gives wonderful performance.

For Complete Information, Write:

SHAWNEE Manufacturing Company, Inc.

1947 North Topeka, Topeka, Kansas

REASONS WHY Huffman-Wolfe Is Privileged To Serve Industry's Leaders

When your company and Huffman-Wolfe get together, you are entrusting your mechanical contracting problems to a "team" whose record stands alone. Before considering any mechanical contractor, you owe it to yourself first to know more about Huffman-Wolfe. Here are some good reasons why:

A Company Is Known by The Clients It KEEPS —Year After Year!

Tennessee Coal & Iron Co.	General Motors Corp.
Timken Roller Bearing Co.	B. F. Goodrich Co.
Aluminum Co. of America	Bethlehem Steel Co.
Koppers Company	Western Electric Co.
Pennsylvania Railroad Co.	Kelsey Hayes Wheel Co.
Baltimore & Ohio Railroad Co.	The Linde Air Products Co.
McCall Corporation	Brown Instrument Co.
National Cash Register Co.	Owens Illinois Glass Co.
Kaiser Alum. & Chemical Co.	The Mead Corporation
Upjohn Manufacturing Co.	Ford Motor Company

1. ***Ability To Integrate Our Work With Yours***—Our years of experience with industry enables us to minimize "down time," work *around* your production.
2. ***Diversified Background***—Every phase of mechanical contracting, a wealth of background in all branches of mechanical equipment installation.
3. ***Strategically Located Facilities*** Complete fabricating branches at four strategic locations: Atlanta, Dayton, Philadelphia and Columbus, Ohio.
4. ***A Willingness To Serve***—Whether your job be small or a complete installation, you are assured your problem will bear the Huffman-Wolfe "touch."

Over A Half Century of How" In:

- General Piping
- Boiler and Power Plants
- Plumbing and Heating
- Instrument and Control Piping
- Power and Process Piping
- Fire Protection Systems
- Industrial and Process Ventilation
- Ventilating and Air Conditioning

MAY WE SERVE YOU TOO?

The Huffman-Wolfe Co.

669 N. High St. • Columbus, O.
• Dayton
• Philadelphia
• Atlanta

SERVING THE NEEDS OF INDUSTRY SINCE 1900

ent floors, walls, turbine pedestals (to show piping under the turbine). It is scaled to $\frac{3}{8}$, $\frac{1}{2}$ or $\frac{3}{4}$ in. so commercial sizes of brass tubing or plastic rod can be used to represent the exact size of the pipes, including insulation.

The prime purpose of most commercial building models is to give a visual impression of the completed structure. But Soper's models have to play a more functional role. For example, a power plant builder wants to know if large-scale and complicated piping will fit the way it is designed. And—because of the various space-saving devices used in engineering drawing—blueprints often cover up a number of design errors.

• **A bird's eye view**—When Soper gets a stack of blueprints his first job is to translate them into his own set of working drawings. These—made on an outsized graph paper—are drawn to the model scale. As soon as all elements of the structure are drawn in, design errors start to crop up. When Soper discovers an error—such as one pipe passing through another—he contacts the builder and the section is redesigned.

After working drawings are completed, parts are made and fitted together. Again, errors in the original design occasionally will show up changes that have to be made.

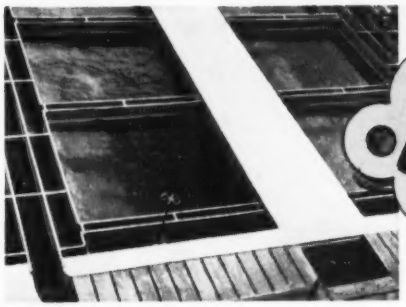
When everything fits according to specifications, parts are painted and final assembly of the plant is made. As soon as the builder receives this final model he can spot any changes he wants to make in the completed plant—changes that could not be visualized from even the most careful study of blueprints. The important thing is that these discoveries are made before construction starts.

The model serves still another purpose. It goes along with the revised blueprints, giving the construction superintendent an exact three-dimensional plan of the structure.

Models shuttle between the Woodbury shop and the client anywhere from three to six times. But this trip tally didn't hold on one job: 150 changes were made.

Today, many motorists traveling along the winding road in front of the model shop pass by without noticing the six-inch-wide business sign on the building. This is Soper's idea. Born in Scotland, he guards time as closely as the Scotsman's caricature guards a penny. Sightseers create interruptions, and these create delay. And delay adds expense for a model that, under any circumstances, may eventually carry a $15,000 tag.

4 KEYS TO BETTER WATER

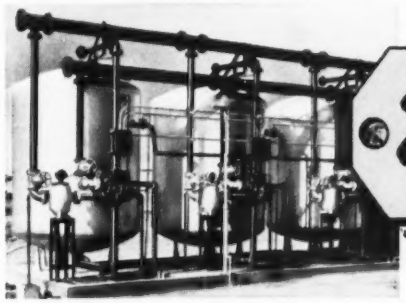


1. PRECIPITATORS

PROBLEM: Turbidity, Color, Hardness, Iron, Alkalinity

PRECIPITATORS remove dirt, color, hardness, iron, alkalinity, silica, fluorides, taste, odor by coagulation, precipitation, and settling. Fully utilize the Permutit sludge-blanket principle for big savings in space . . . chemicals . . . time!

Horizontal or vertical designs of any capacity. Tailor-made units to *triple* capacities of old-fashioned settling basins.

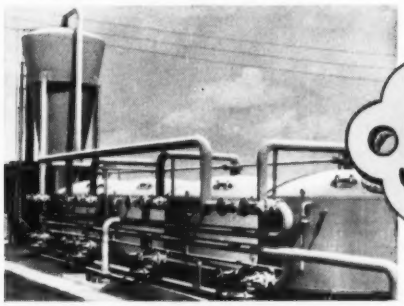


2. SOFTENERS

PROBLEM: Hardness with Some Iron, Manganese

SOFTENERS quickly reduce hardness to zero . . . while removing troublesome iron and manganese. Simplest method. Gives positive results with no waste disposal problem. Features ease of operation, low installation and operating costs.

Pressure or gravity units or batteries—any capacity. Permutit automatic controls give uninterrupted supply of softened water, save operator's time, increase efficiency of old plants.



3. SPIRACTORS®

PROBLEM: Hard, Clear Water

SPIRACTORS soften on new principle—*catalytic precipitation.* Hard water and lime-soda swirl upward through catalyst granules. Precipitates deposit by accretion, fall to bottom, are easily disposed of. Water at top is soft, clear, ready for filtration. *Total reaction time is eight minutes.* Lime treatment with no bulky sludge disposal problem.

4. FILTERS

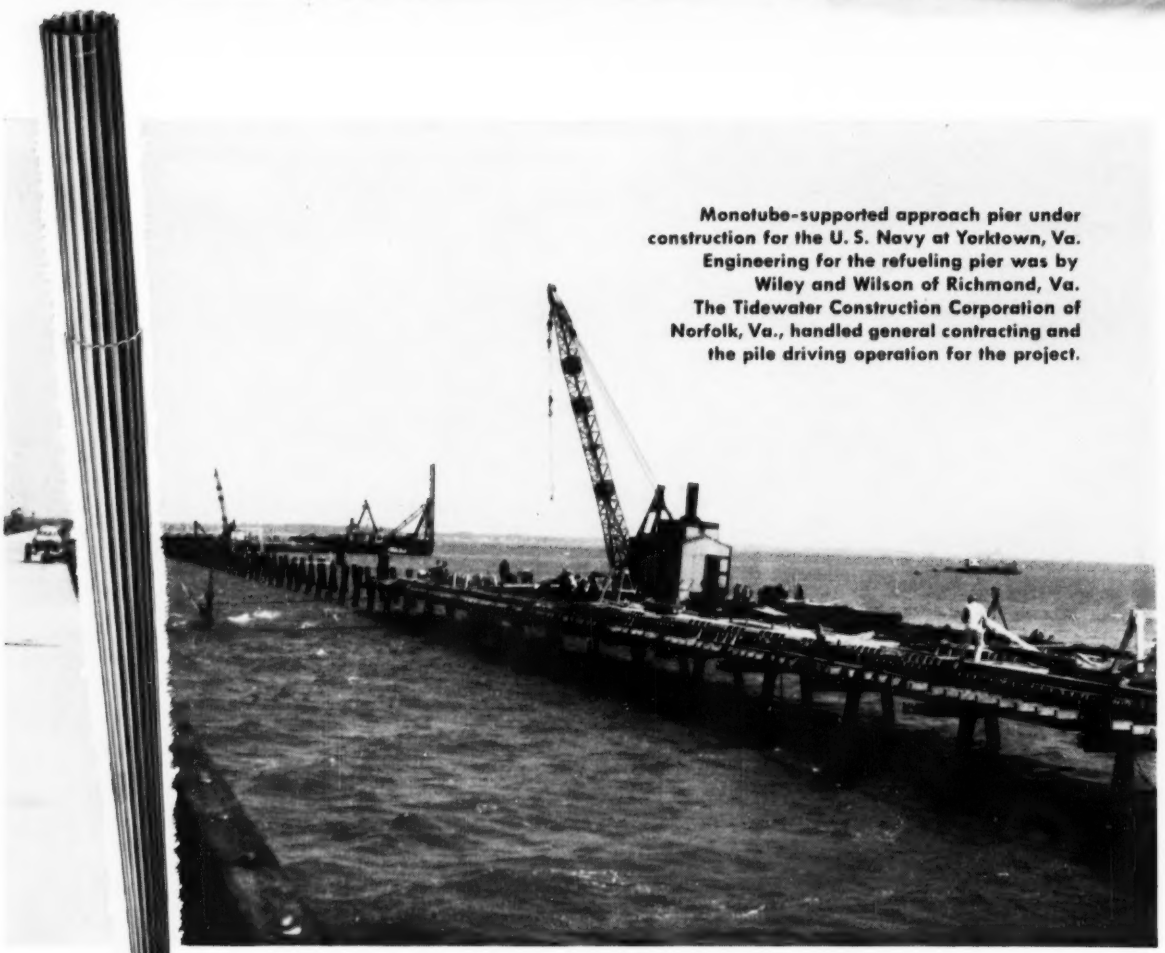
PROBLEM: Traces of Dirt, Oil, Iron

FILTERS trap the last traces of suspended impurities, deliver a crystal-clear effluent. Permutit rapid sand filters are available in vertical or horizontal steel shells, and gravity types in wood or concrete. These units feature Permutit automatic controls. Wash, rewash and return to service—with no operator present!

FREE WATER ANALYSIS! Write today for free bulletins on these or any other water conditioning processes. Permutit will analyze your water supply, make recommendations without obligation. THE PERMUTIT COMPANY, Dpt. ENR-11, 330 West 42nd Street, New York 36, N. Y.

PERMUTIT®

WATER CONDITIONING HEADQUARTERS FOR OVER 40 YEARS



Monotube-supported approach pier under construction for the U. S. Navy at Yorktown, Va. Engineering for the refueling pier was by Wiley and Wilson of Richmond, Va. The Tidewater Construction Corporation of Norfolk, Va., handled general contracting and the pile driving operation for the project.

Rigid Cold-Rolled MONOTUBES... ideal choice for pier construction

DURING the recent construction of the U. S. Navy fueling pier at Yorktown, Virginia, Monotube piles proved how easily they can be installed with perfect alignment in approximately 40 feet of water.

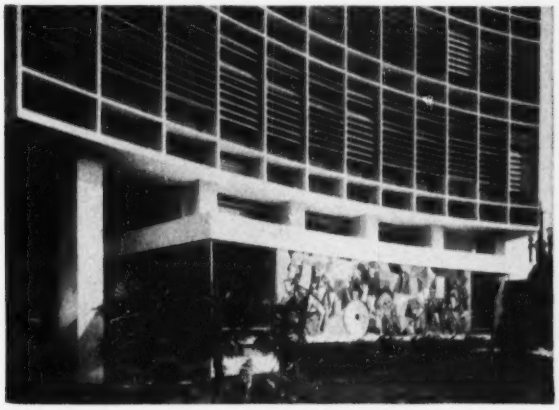
766 Monotubes were used in the 3000-foot pier. By means of a simple girt weld, the piles were rapidly extended, *as the driving progressed,* to meet the requirement for 100 to 140-foot completed lengths. Result: faster project completion . . . reduced installation costs!

The cold rolling process of manufacture results in exceptional rigidity and strength to resist the "dead" and high "live" loads to which piers are subjected.

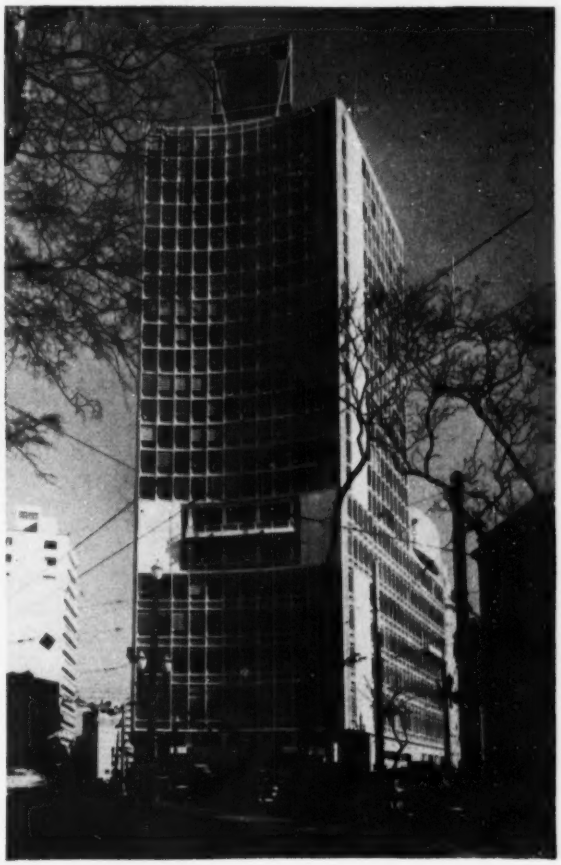
For assistance in solving your foundation problem, write to The Union Metal Manufacturing Company, Canton 5, Ohio. Newly published Catalog No. 81 is now available.

UNION METAL

Monotube Foundation Piles



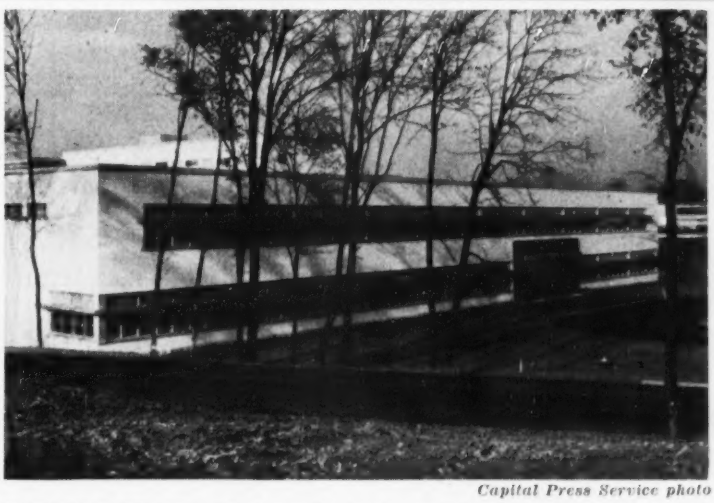
SUN BAFFLES consist of adjustable metal louvres framed in concrete fins. Glazed tile mosaic sets off entrance.



Reinforced concrete building houses newspaper and hotel

Recently completed in Sao Paulo, Brazil, this striking 26-story reinforced concrete building houses one of Brazil's biggest newspapers, "O Estado de S. Paulo", on its first seven floors, and a hotel occupies the space from the eighth floor up. Foundation work for the $3.7-million building started late in 1947, and the first concrete was poured in January, 1948. The original plan called for offices to occupy the upper stories of the structure, but a later switch to the hotel plan—calling for extensive structural and mechanical changes—delayed completion of the building until this year.

Architect was Jacques Pilon of Sao Paulo.



Capital Press Service photo

RESEARCH CENTER, which may be the first structure in the world designed specifically for research on buildings, was dedicated recently in Ottawa, Ont., at the convocation of the Canadian National Research Council. Erected to serve Canada's construction industry in the many problems in this field, the building was designed by J. C. Meadowcroft, Montreal, with Keith & Associates as consulting engineers. Robertson Construction & Engineering Co., Niagara Falls, Ont., were the general contractors.

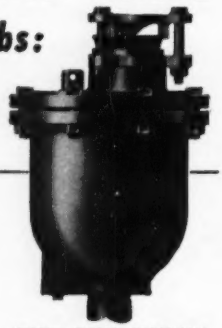
International briefs . . .

• **Greek hydro bids asked**—Greece has asked proposals for the financing, engineering, design, and construction of the $15.5-million Megdova River hydroelectric project (ENR May 14, p. 90). Preliminary surveys for the project, were made by Knappen-Tippetts-Abbett-McCarthy, New York. The project will include irrigation canals, land leveling, drainage pumping stations, storage wells, and a power transmission line.

• **Bosporus span**—The Turkish government has announced that contracts totaling $68-million are to be signed with the Krupp engineering works, Essen, Germany, for the construction of a suspension span across the Bosporus at Istanbul (ENR August 27, 1953 p. 58). The bridge will be 4,920 ft long with a central span second in size only to the 4,200-ft span of the Golden Gate Bridge, San Francisco. The Turkish government has asked the nation's private banks to supply over half of the total cost.

New! **SIMPLEX AV VALVE** *does 2 jobs:*

1. STOPS PIPELINE COLLAPSE!
2. ENDS AIR ACCUMULATIONS!



Type AV Valve is a compact, combination air release and air inlet valve. It performs three separate functions:

- Admits air to break vacuums . . . prevents pipeline collapse.
- Releases air automatically to increase pumping efficiency.
- Vents large quantities of air when filling the system . . . saves buying an oversized valve.

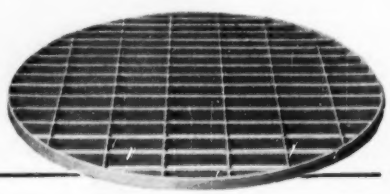
High Discharge Capacity! 880 cubic feet of free air per minute at 10 psig, over 2200 C.F.M. at 50 psig.

CHECK THESE FEATURES! Compact! Only 11⅜" x 16¼" in size. Easy to install! One standard 2" pipe connection. Positive-acting, non-corrodible float. Tested hydrostatically to 300 psig.

Write for Free Technical Bulletin No. 1203
SIMPLEX VALVE & METER COMPANY
6751 UPLAND STREET, PHILADELPHIA 42, PA.

SIMPLEX®
VALVE AND METER COMPANY

REMOVE THE DANGER OF OPEN AREAS



Here's the Solution!

Blaw-Knox Electroforged Steel Grating is the ideal "coverage" for unprotected pits, light wells, basement stairways and other hazardous open areas. It is a one-piece steel "material" that provides safe footing under any conditions, and admits the maximum of light and air. *Strong . . . Silent . . . Secure.* Thousands of installations are still on the job after 20 years of traffic!

Send us dimensional sketch
We will then forward you price on grating cut to exact size. No nuts, no bolts, no special tools required. Don't delay . . . write today and make those danger spots both safe and usable!

BLAW-KNOX COMPANY
Grating Department
BLAW-KNOX EQUIPMENT DIVISION
2001 Farmers Bank Building
Pittsburgh 22, Pa.
Sterling 1-2700

ELECTROFORGED® STEEL

BLAW-KNOX GRATING

OBITUARIES

Edward D. Lumsden, 82, retired civil engineer who helped plan the first subway tube under the East River in N. Y. City, and the seawall at Galveston, Tex., died at Tulsa, Okla., Oct. 29. He was a graduate of the University of Georgia. He spent four years on railroad building work in Chile. He had been city engineer of Sherman, Tex., and assistant city engineer of Oklahoma City, Okla.

Foster J. Beach, associate civil engineer with the N. Y. State Department of Public Works, died at Oxford, N. Y. on Oct. 28. He began his engineering career on N. Y. State Barge Canal work and at one time was in charge of state public works in Chenungo County.

Professor Emeritus Lewis M. Gram, 76, chairman of the University of Michigan's civil engineering department until 1946, died Nov. 9 in Ann Arbor, Mich. He retired in 1946 after 33 years service. He was director of plant expansion at the university from 1930 until his retirement. During that time, he directed the planning of $20-million worth of university buildings. He also served as consultant on construction of the Belle Isle Bridge and three bridges spanning the River Rouge in Detroit.

Harold S. Woodworth, 64, prominent contractor of the Pacific Northwest, died Nov. 1 at Tacoma, Wash. Born in Michigan, he moved to Tacoma as a boy and, as a young man, organized Woodworth & Co., heavy construction firm.

William B. Haite, 68, former superintendent of public building construction for District 8 of the New York State Department of Public Works, died Nov. 5 in Amenia, N. Y. He had served the state 35 years before retirement in 1951.

Ernest L. Merrill, 69, retired chief highway engineer of the Maine highway commission, died at Augusta Oct. 29. He was with the commission for 37 years, and became chief engineer in 1940. He retired several months ago.

Hugh Leo P. Stewart, 60, engineer at the Bureau of Reclamation headquarters in Denver for 14 years, died Nov. 3 in Denver. He received a civil engineering degree from Stanford University and managed steel plants in Ohio before going to Denver in 1934. He left government service in 1948.

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

Mass., Kingston—SCHOOL—B.A. 12/10—Office Supt. Schools, Kingston Elementary School, Kingston, brick veneer Silver Lake Regional High School, vicinity of here, for towns of Kingston, Pembroke, Halifax and Plympton Regional School, Comr. J. Farmer, chn., West Elm St., Pembroke, Mass. $900,000. Plans deposit $50. Walter M. Gaffney, 43 Potter St., Hyannis, archt. CD 2/25, under Mass., Halifax.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Lane Constr. Corp.,** 965 E. Main St., Meriden, Conn. CA **$8,837,652,** est. $5,000,000. runways, taxiways, aircraft fueling sys., Westover Air Force Base, ENG.-19-016-54-22, CHICOPEE FALLS, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 9/22, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Eagle Constr. Co.,** 60 Park Place, Newark, N. J. CA Est. **$2,000,000.** 202 HOUSING units adjacent to Fort Devens, AYER, MASS. Fort Devens Manor, Inc., Milton Zerman, pres., 60 Park Place, Newark, N. J.

▲ **M. S. Kelliher Co.,** 294 Washington St., Boston, Mass. LB Est. **$1,250,000.** Fontbonne ACADEMY, MILTON, MASS. Congregation of Sisters of St. Joseph, Rev. Mother Euphrasia, mother superior, 303 Adams St., Milton, Mass. CD 10/22.

M. Slotnick Corp., 333 Washington St., Boston, Mass. CA Est. **$600,000.** HOSPITAL addn., alterations, 45 Townsend St., PROJ. NO Mass 28C-J-0, ROXBURY, MASS. Jewish Memorial Hospital, 45 Townsend St., Roxbury, Mass. Bids Oct. 9. CD 9/22.

Joseph P. Flynn, 26 Custom House St., Providence, R. I. LB **$332,900.** est. $325,000. Public Works GARAGE and repair SHOP, Terminal Rd.; LB **$316,950,** est. $300,000 municipal GARAGE, Ernest St., PROVIDENCE, R. I. City, City Hall, Providence, R. I. Bids Nov. 9. CD 11/5 and 10/20.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. J., Port Newark—SPRINKLER SYSTEM SUPPLY MAINS—B.A. 12/3—The Port of New York Auth., 111-85th Ave. New York 11, N. Y., relocation sprinkler system supply mains, in Building 105, Contract O&M 206, proposal No. 287. CD 4/9/52, under Public Buildings.

New York—DUCT LINES—B.A. 12/4—New York City Transit Auth., 370 Jay St., Broadway, Zone 1, duct lines between 159th Ave. (Howard Beach) and Liberty Ave., Queens Boro. CD 8/31/45.

Pa., Phila.—B.A. 12/7—Dpt. Procurement, City Hall Annex, Bid No. 2073 (Constr. SD-120-SE) general constr., furnishing and installing mech. equip. and piping for a blower and primary sludge pumping bldg., 1 story bsmt. 51x60 ft. wide bldg., rein.-con. substructure, steel framing with brick walls superstructure, mech. equip. incl. two 1,500 CFM positive displacement blowers; two 250 GPM sludge pumps; two 500 GPM sludge pumps, four screw pumps, six discharge, 2 plunger pumps and appurtenant work; Bid No. 2074 (Constr. SD-121-SE) plumbing; Bid No. 2075 (Constr. SD-122-SE) heating installation for the bldg., Bid No. 2076 (Constr. SD-123-SE) furnishing, installing electrical equip. and appurtenant work. Plans deposit $25. A. Albert Cherashore, Procurement Comr. CD 3/11/46.

N. Y., Jackson Heights—PUMP HOUSES—B.A. 12/8—At office Chief Engr. of The Port of New York Auth., 111 Eighth Ave., New York, Zone 11, two storm water pumping stations, LaGuardia Airport, constr. LGA 160.-003. Plans deposit $25.

BIDS ASKED—BUILDINGS

▲ **N. Y., New York**—HOUSING—B.A. 12/1—New York City Housing Auth., 63 Park Row, Zone 38, foundations and general constr., heating and ventilating, electric work, plumbing, furnishing, installing elevators for LaGuardia Houses, Proj. No. NY 5-21, Sect. I, Incl. bldgs. 4, 5, 7 and 9 in areas in Manhattan Boro, in block bounded by Montgomery, Monroe, Clinton and Madison Sts., Bldg. 5 in easterly half of block bounded by Madison, Clinton, Monroe and Jefferson Sts. and Bldg. 4 in easterly half of block bounded by Monroe, Clinton, Cherry and Jefferson Sts., Plans deposit $75. $25 elevators. Extended date. CD 10/26.

N. Y., Brooklyn—LIBRARY—B.A. 12/2—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, general constr., plumbing, heating and ventilating, electrical work and lighting fixtures for constr. of New Utrecht Branch Library, 1743 86th St., Brooklyn Boro. Plans deposit $25. CD 6/13/51.

N. Y., New York—SCHOOL etc.—B.A. 12/9—Dir. Bureau Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general constr. new addn. to and modernization of existing P.S. 15, 4th St. between Avenues C and D. Plans deposit $20.

N. Y., New York—SCHOOL, etc.—B.A. 12/10—Dir. Bureau Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general constr. of new addns. to and modernization of existing P. S. 74, E. 189 S. between Crotona and Prospect Aves., Bronx Boro. Plans deposit $28.

N. Y., New York—HIGH SCHOOL—B.A. 12/11—Dir. Bureau Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general constr. new Junior High School 104, E. 21 St. between 1st and 2nd Aves., Manhattan Boro, E-221. Plans deposit $35.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW JERSEY and PENNSYLVANIA**—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.

American Bridge Div., U. S. Steel Corp., 525 William Penn Pl., Pittsburgh, Pa., LB, **$4,768,293.** Contract No. 5, cables and suspenders, ropes for suspension bridge over Delaware River connecting Packer Ave., Phila., Pa., and Gloucester City, N. J. Bids Nov. 12. CD 10/19.

Hale Electric Co., Inc., 1105 Washington Blvd., Pittsburgh 6, Pa., LB **$363,182,** est. $180,000, electrical imprvs.;

V. R. Yoder, 116 Spring St., Meadville, Pa., LB **$179,889,** est. $140,000, steam distr. sys. imprvs., Torrance State Hospital, TORRANCE, PA. General State Auth., 18th and Herr Sts., Harrisburg, Pa. Bids Nov. 12. CD 10/30.

BUILDINGS

LOW BIDS AND CONTRACTS

Zwigard Constr. Co., 239 Milburn Ave., Milburn, N. J. CA **$326,391,** elementary SCHOOL, LIVINGSTON, N. J. Bd. Educ., 184 S. Livingston Ave., Livingston, N. J. Bids Oct. 6. CD 9/25.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

VIRGINIA—State Hy. Dpt., 1221 E. Broad St., Richmond,

Codell Constr. Co., Winchester, Ky., LB **$729,290,** grading, drainage 3.58 mi. and 100 ft. bridge, Rte. 60, Clifton Forge, Proj. 2103-07-08, Allegheny Co. Bids Nov. 5. CD 10/23.

† **Ames & Webb, Inc.,** P.O. Box 4001, Broad Creek Village Station, Norfolk, Va., LB **$647,212,** addnl. paving, approx. 61,330 sq. yd. 11 in. concrete parking aprons and taxiways, etc., Naval Air Station, NOY 75701, NORFOLK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids Nov. 10. CD 10/26.

▲ **WEST VIRGINIA**—W. Va. Turnpike Comn., 1340 Wilson St., Charleston,

Wright Contg. Co., 504 25 Ave., Columbus, Ga., LB, **$1,145,240,** wood posts; **$1,239,940,** steel posts, Contract 39, furnishing, installing 350,000 lin. ft. 10 ga. corrugated steel guard rail on wood or steel posts between Princeton Mile 0 and Charleston Mile 88 Mercer, Raleigh, Fayette and Kanawha Counties. Bids Oct. 27. CD 10/5.

BUILDINGS

LOW BIDS AND CONTRACTS

Mottley Constr. Co., Farmville, Va., CA **$976,355.** Long Street and Cherry Ave. Elementary SCHOOLS, CHARLOTTESVILLE, VA. City School Bd., City Hall, Charlottesville, Va. Bids Nov. 4. CD 11/10, under LB.

Mottley Constr. Co., Farmville, Va. CA **$559,875.** Consolidated HIGH SCHOOL, near LOVINGSTON, VA. Nelson Co. School Bd., Lovingston, Va. Dixon & Norman, 1103 E. Main St., Richmond, Va., archts. Bids Nov. 4. CD 11/10, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

Tex., Vernon—B.A. 12/10—City, sewage treatment plant. $100,000. Plans deposit $25. Joe E. Ward, Oil & Gas Bldg., Wichita Falls, engr. CD 4/15.

Mich., Detroit—B.A. 12/15—Bd. Water Comrs., Water Bd. Bldg., 735 Randolph St., Contr. No. NE-7, chemical bldg. and misc. structures, Northeast Station for Dpt. Water Supply. Plans deposit $50. L. G. Lenhardt, supt., genl. mgr. and ch. engr. CD 11/11/48.

BIDS ASKED—BUILDINGS

† **Ill., Kewanee**—STORAGE, etc.—B.A. 12/8—Dpts. Army & Air Force, National Guard Bureau, office of U. S. Property & Disbursing Officer, State of Illinois, Illinois Natl. Guard General Depot, P. O. Box 549, Springfield, Vehicle Storage and Warehouse Bldg. with Service Center "B" NG-11-115-54-3. Plans deposit $15.

† **Ill., Macomb**—STORAGE and WAREHOUSE—B.A. 12/8—Dpts. Army & Air Force, National Guard Bureau, Office of U. S. Property & Disbursing Officer, State of Illinois, Illinois National Guard General Depot, P. O. Box 549, Springfield, Vehicle Storage and Warehouse with Service Center "B" NG-11-115-54-1. Plans deposit $15.

† **Ill., Paris**—STORAGE, etc.—B.A. 12/8—Dpts. Army & Air Force, National Guard Bureau, office of U. S. Property & Disbursing Officer, State of Illinois, Illinois National Guard Generzl Depot, P. O. Box 549, Springfield, Vehicle Storage and Warehouse Bldg. with Service Center "B", NG-11-115-54-2. Plans deposit $15.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Mont., Great Falls**—HOSPITAL, etc.—B.A. 12/18—U.S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., 1 story, 52,200 sq. ft. masonry hospital, 1 story, 4,000 sq. ft. frame dental clinic Great Falls Air Force Base, Inv. 54-80. $1,500,000. Plans deposit $40 for hospital, $10 for clinic. CD 11/11.

BIDS ASKED—BUILDINGS

† **Tex., Fort Hood**—HEADQUARTERS—B.A. 12/10—U.S. Eng., 100 W. Vickery St., Fort Worth, 4 battalion headquarter bldgs., 8 barracks bldgs. addns. CD 9/15/52.

† **Mo., Independence**—ADDITIONAL FACILITIES—B.A. 12/15—U.S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., Part IV addnl. facilities, 41 bldgs., steam and cond. lines, elec. distr. and storage lighting sys., disposal sys., pond, hy. bridge, Lake City Arsenal, ENG-23-028-54-13. Plans deposit $100. CD 5/29/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MISSOURI**—State Hy. Comn., Jefferson City,

Land Constr. Co., 502 Seneca St., St. Joseph, Mo. CA $105,667. b. conc. 4.681 mi., Nodaway Co.;

J. A. Tobin Constr. Co., 3700 Rainbow St., Kansas City, Mo. CA **$514,069.** 24 ft. c. conc. 4.169 mi. Clay Co.; CA **$457,884,** 24 ft. c. conc. 3.737 mi. Clay Co. Grand total $1,077,620. Bids Oct. 30, awarded Nov. 10. CD 11/6, under LB.

Reising Constr. Co., Mission, Tex., CA $245,000, earthen reservoir unit for irrigation usage;

Purchases, Day Labor, Sub-Contracts, $200,000, one pumping plant unit for irrigation proj., MISSION, TEX. Water Dist. 16, Mission, Tex. CD 8/10/51.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply	**Latin America**
Sewers, Waste Disposal	**Public Buildings**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects inviolved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

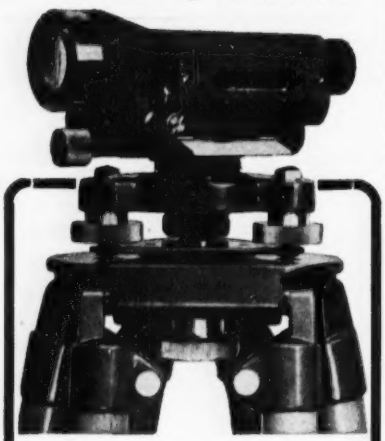
CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
B.A.	**Bids Asked**
ENR	**Engineering News-Record**
CD	**Engineering News-Record Construction Daily**

From the Wheel That Built An Empire . . .



Fabulously wealthy . . . rich beyond description . . . the land of the Pharaohs drew its glory bucket by bucket from the muddy Nile . . . brought to its fields by the straining back of a slave and the creaking gear of the water wheel.

THE KERN NK2 LEVEL

The latest in modern design — amazingly compact and only 3½ lbs in weight . . . the superb Kern NK2 level actually possesses a mean accuracy of ± 1/100th ft. per mile. Designed for one hand operation all controls are easily accessible on the right side. 24X telescope, plus coated optics throughout give unbelievable brilliance. Each instrument features a bullseye bubble for rough leveling plus a coincidence bubble for fine leveling. Another demonstration of Kern skill and craftsmanship. Write TODAY for complete information and details.

Complete Service Department
Factory Trained Personnel

KERN SURVEYING INSTRUMENT DIVISION

Paul Reinhart Co., Inc.
68 Beaver St., New York City

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Jas. H. Stewart Co., Inc.,** 230 Park Ave., New York, N. Y. CA Est. $1,000,000. general contract distr. PLANT on 8.2 acre tract, U.S. 71 and Bellefontaine, KANSAS, CITY, MO. Avon Products Inc., 16 and Walnut Sts., Kansas City, Mo. Geo. L. Dahl, 2101 N. St. Paul St., Dallas, Tex., archt. CD 11/2.

▲ **Builders Constr. Co.,** Kerr-McGee Bldg., Oklahoma City 2, Okla., CA **$2,887,394,** est. $2,000,000. Classen HIGH SCHOOL, 27 and May Sts., OKLAHOMA CITY, OKLA. Bd. Educ., 400 N. Walnut St., Oklahoma City, Okla. Bids Oct. 6, awarded Nov. 10. CD 10/9, under LB.

Bill Nierth, Contractor, 4601 Oakdale Dr., Houston, Tex. Owner Builds. **$315,000.** 7 masonry DWELLINGS, air-conditioning; **$300,000,** eight 1 and 2 story masonry dwellings, HOUSTON, TEX. CD 11/6.

Thad A. Simmons, 406 Christine St., Houston, Tex. Owner Builds. **$390,000.** 45 DWELLINGS near HOUSTON, TEX. CD 11/6.

King Constr. Co., 311 Texarkana Natl. Bank Bldg., Texarkana, Tex., CA **$937,068,** est. $937,500, 125 low-cost HOUSING units, TEXARKANA, TEX. Texarkana Housing Auth., Texarkana, Tex. Bids Nov. 4. CD 10/13.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Wash., Richland**—PUREX FACILITY—B.A. 12/2—Atomic Energy Comn., Richland, purex facility at Hanford Works with waste disposal facilities incl. underground tanks and pipe lines, Inv. AT (45-1)-821. CD 6/30/52.

Wash., Pasco—B.A. 12/10—City, City Hall, 5 m.g. concrete water reservoir and 4 mi. 16- to 36-in. mains. $400,000. Plans deposit $25, Cornell, Howland, Hayes & Merryfield, 1600 Western Ave., Corvallis, Ore., engrs. CD 7/15.

† **Wash., Fort Lewis**—B.A. 12/15—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, b. conc. surf., drainage 23,000 lin. ft. road extens., Inv. 54-81. CD 11/12.

† **Wash., Everett**—WAREHOUSE—B.A. 12/16—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 80x240 ft. frame A. C. troop-Supply warehouse at Paine Air Force Base, ENG-45-108-54-83. CD 2/3.

† **Idaho**—B.A. 12/22—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing two 20x50 ft. radial gates for Palisades Dam, Palisades Proj., Spec. DS-4078. W. A. Dexheimer, adv. ENR 11/26. CD 9/12/44.

BIDS ASKED—BUILDINGS

† **Wash., Fort Lewis**—WAREHOUSE—B.A. 12/3—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, install dehumidification equip. at general supply warehouse, Mount Rainier Ordnance Depot, Inv. 54-82. CD 11/12.

† **Wash., Richland**—PLANT—B.A. 12/17—Atomic Energy Comn., Richland, 160x180 ft., steel frame development-work pilot plant at Hanford Works. CD 6/30/52.

▲ **Wash., Olympia**—OFFICE—B.A. 12/22—State Capitol com., Olympia, 5 story, rein.-con. office bldg. $4,000,000. Plans deposit $100. A. G. Lumm, 321 S. 11 St. Tacoma, archt. CD 7/5/51.

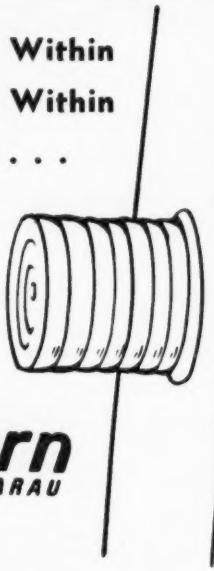
HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Echeumann & Johnson, Lloyd Bldg., Seattle 1, Wash. CA $219,700. GRAIN ELEVATOR at Pier 25, SEATTLE, WASH. Port of Seattle Comn., Bell St. Terminal, Seattle 1, Wash. CD 10/13.

▲ **Arundel Corp. & L. E. Dixon,** 409 S. California St., San Gabriel, Calif., CA, **$3,167,709** La Cienega and San Fernando Valley Relief Sewer, Unit "B" Section 2, LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Oct. 28, awarded Nov. 12. CD 11/5, under LB.

Wheels Within Wheels Within Wheels . . .



MODEL 1082

Taken for granted, often overlooked, the center wheel of your bow problem represented an enormous problem for Kern engineers. Ordinary wheels, in time, warp and wear slightly . . . destroying the absolute precision every Kern instrument must have. The answer was lamination . . . the careful manufacture of this tiny wheel layer by layer. A tiny detail, yes, but one that represents in essence the care and study that lies behind the Kern name.

FAMED KERN TRADITION

Meticulous attention to every minute feature . . . painstaking devotion to every single facet . . . every minute feature of your instrument. . . . These are the secrets of Kern superiority . . . the hidden guarantees that give you performance and dependability beyond compare.

SEE OUR COMPLETE LINE

Write today for our new, fully illustrated catalogue of sets and individual pieces. Set prices from $15 to $100. Bow divider pictured $4.70.

At your nearest dealer, or write direct to:

KERN DRAWING INSTRUMENT DIVISION

Borden & Riley Paper Co.
60-R E. 11th Street, New York City

Kern
AARAU

PRECISION INSTRUMENTS SINCE 1819

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Preston Constr. Co.**, Smith Tower, Seattle 4, Wash., CA, $2,000,000, 8 WAREHOUSES and TRUCK REPAIR SHOP, totaling 505,000 sq. ft. for distribution center, BELLEVUE, WASH. Safeway Stores, Inc., 1260 4 Ave. S., Seattle, Wash. CD 7/2/52.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ont., Toronto**—TEACHERS COLLEGE—B.A. 12/3—Dpt. P. Wks., Parliament Bldgs., 2 story, bsmt. ,180x360 ft., steel teacher's college, 100x150 ft. interior court, concrete fdn., Carlaw Ave., $2,000,000. Plans deposit $50. Page & Steele, 72 St. Clair Ave., W., archts., G. N. Williams, c/o owner, deputy minister and ch. archt. CD 9/11.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

SASKATCHEWAN—Province of Saskatchewan, Regina,

Floyd Barber Ltd., 601 Albert St., Regina, Sask., CA $560,000, road construction Moosonin to Manitoba Boundary, Moosonin. CD 8/29/51.

Bennett-Pratt Ltd., 5 Maple Leaf Dr., Weston, Ont., CA, $217,827, 1 and 2 story, bsmt., 130x152 ft., concrete, block, brick training bldg. at R.C.A.F. Station, NORTH BAY, ONT. Defense Constr. Ltd., 40 Eglinton Ave. E., Toronto, Ont. Bids Oct. 14, awarded Nov. 5. CD 9/25.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—ELECTRIC SYSTEMS—B.A. 12/10—U. S. Eng., Anchorage, electric distr. sys. and navigational-aid bldgs., at various locations, Inv. 54-24.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **S. S. Mullen**, 621 9th Ave. N., Seattle, Wash., CA $101,176, dolphins and test piling, Inv. 54-37, WHITTIER, ALASKA. U. S. Eng., Anchorage, Alaska. CD 8/7.

Proposed Projects

WATER SUPPLY

▲ **Mich., Mount Clemens**—City, water sys., expansions to provide service to Clinton and Harrison Twps., inc. addn. to Lake St. Clair filtration plant, $550,000; storage facility, also pipe lines, etc., $400,000. Total est. $1,250,000.

▲ **O., Columbus**—City, City Hall, 36 in. water force main to connect Dublin Rd. to treatment plant with 20 in. main. $1,250,000. CD 6/27/51.

SEWERS, WASTE DISPOSAL

▲ **Calif., San Jose**—City, City Hall, primary sewage treatment plant. $3,000,000.

▲ **Calif., Vallejo**—Vallejo Sanitation & Flood Control District, City Hall, sewage disposal plant and storm sewers. $6,786,000. Brown & Cadwell, 283 Sansmoe St., San Francisco, consult. engrs. CD 5/23/47.

▲ **Mich., Detroit**—City, Carl D. Warner, comr. Dpt. P. Wks., Guardian Bldg., voted bonds Nov. 3, storm relief sewers, incl. Asland Storm Relief Sewer, $10,000,000; sewer and pumping station Delr Sect., $2,000,000; Schoolcraft Sewer, $6,000,000; Livernois exten., $3,000,000, misc., $1,000,000. George R. Thompson, city engr.

▲ **Minn., Golden Valley (Minneapolis P.O.)**—Village, K. W. Rahn, clk., 2200 Glenwood Parkway, lateral sewer connections to joint Crystal-Golden Valley sanitary sewerage system feeding into trunk interceptor being built from Crystal. $1,000,000. G. M. Orr Eng. Co., 1004 Marquette Ave., Minneapolis, consult engr. CD 5/14.

▲ **Minn., St. Paul**—City, City Hall, voted $8,100,000 bonds, sewers.

▲ **O., Ashtabula**—City, voted bonds Nov. 3, sewage disposal plant. $1,500,000. Fred A. Collins, city engr. CD 8/11.

▲ **O., Avon Lake**—Village, voted $1,265,000 bonds Nov. 3, storm sewers, misc. streets. CD 11/13/52.

▲ **Tex., Abilene**—City, City Hall, cancelled bond election of Nov. 24, Phase 1, sanitary sewerage sys. rehabilitation, $225,000; Phase 2, sewer lift stations, $175,000; Phase 3, sewage disposal plant, $200,000; Phase 4, sanitary sewer collection lines, $750,000; Phase 5, storm sewers, $125,000. CD 11/5.

▲ **Va., Richmond**—Henrico Co., 22nd and Main Sts., voted bonds Nov. 3, three sewage treatment plants, sewer and water lines and tanks, Sanitary Dist. A, near here. $3,950,000. R. Stuart Royer & Assocs., 15 W. Cary St., consult. engrs. CD 10/6.

BRIDGES

▲ **O., Euclid**—City, 585 E. 222 St., voted bonds Nov. 3, grade crossing elimination, $1,000,000. Leroy G. Williams, city engr. CD 10/7.

▲ **O., Hamilton**—City, defeated bonds Nov. 3, underpass at South Hamilton R.R. crossing, $1,750,000. CD 7/13.

▲ **Okla., Oklahoma City**—Oklahoma Co., Court House, bond election Dec. 8, three county bridges over North Canadian River. $1,053,000. Hodgins, Thompson & Ball, 1100 W. Main St., consult. engrs. CD 10/24/46.

▲ **Man., Winnipeg**—Municipality, City Hall, ratepayers voted in favor, bridge construction across Assinibodine River at Midtown, $1,100,000. W. D. Hurst, City Hall, city engr. CD 10/5.

STREETS AND ROADS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Barnstable and Yarmouth—Mid-Cape Hy., westbound lane 4.8 mi. 24 ft. wide with 8 ft. grass shoulders on each side beginning at traffic circle at Iyannough Rd., Barnstable and exten. to point east of Willow Street Yarmouth relocation of Rte. 6, $1,100,000. CD 6/16.

▲ **Minn., St. Paul**—City, City Hall, voted $12,400,000 for streets, bridges and flood control.

EARTHWORK, WATERWAYS

▲ **California**—Pacific Gas & Electric Co., 445 Sutter St., San Francisco, development hydro-electric project on North Fork of Feather River, near Quincy and Oronville, Butte Co. $40,490,000. FPC has granted a 50-yr. license. CD 5/23/52.

▲ **New York**—Power Authority of State of New York, 55 Elk St., Albany, Zone 1, hydro-electric project in International Rapids Sect. St. Lawrence River, between Massena, N. Y. and Cornwall, Ont. $315,000,000. Sanderson & Porter, 52 Williams St., New York, N. Y., and Charles T. Main, 80 Federal St., Boston, Mass., consult. engrs.

▲ **Okla., Oklahoma City**—City, City Hall, bond election Dec. 8, North Canadian River floodway imprvs. $1,812,000. Hodgins, Thompson & Ball, 1100 W. Main St., consult. engrs.

AIRPORTS

▲ **Ind., Indianapolis** — TERMINAL, etc. — Bd. Aviation Comrs., Col. P. H. Roettger, supt., c/o Weir Cook Field, plans by Edward D. James, 222 E. Michigan St., Zone 4, airport imprvs., terminal bldg. $1,400,000; Instrument runway, $1,000,000. CD 2/6/48.

▲ **Mo., Kansas City**—OVERHAUL BASE—City, City Hall, overhaul base at new Industrial Airport, main hangar bldg., engine overhaul bldg., 6 test cells, storage bldg., offices, communications and recreation facilities, $15,700,000. Burns & McDonnell Eng. Co., Box 7088, Kansas City, Mo., consult. engr. Ammann & Whitney, 76 9th Ave., New York, N. Y., consult. engrs. Richard M. Huber, 20 W. 9 St., Kansas City, Mo., ch. constr. div. engr. Trans World Airlines, Inc., 20 W. 9 St., Kansas City, Mo., lessee. CD 9/10.

▲ **O., Richmond Heights**—AIRPORT—Cuyahoga Co., Court House, Cleveland, Zone 14, imprv. County Airport, incl. 1,550 ft. taxistrip and 3,600 ft. runway. $2,363,000. A. S. Porter, Standard Bldg., Cleveland, Zone 14, co. engr.

LATIN AMERICA

▲ **Cuba, Havana**—City, plans modernization water supply sys. $14,000,000.

AMERICANS ABROAD

▲ **Egypt, Cairo**—HOTEL—Hilton Hotels International, Inc., 301 Park Ave., New York 22, N. Y., U. S. A., plans by Welton Becket & Assoc., 5657 Wilshire St., Los Angeles, Calif., U. S. A., 400-room air-conditioned 10 story hotel, 6-acre site on Nile River. $6,000,000.

FOREIGN

▲ **Lebanon, Beirut**—BROADCASTING STATION—Govt. of Lebanon, Beirut, plans broadcasting station. $1,250,000. Foreign firms will be invited to bid.

▲ **Syria, Damascus**—HOUSING—Govt. of Syria, Damascus, housing, near Damascus for govt. officials. $1,000,000. Foreign firms will be invited to bid.

PUBLIC BUILDINGS

▲ **Calif., Redding**—AUDITORIUM—City, City Hall bond election Dec. 15, civic auditorium. $1,600,000. CD 9/10.

▲ **Ill., Chicago**—HOUSING—Chicago Housing Auth., 608 S. Dearborn St., plans by Friedman, Alschuler & Sincere, 223 W. Jackson Ave., Chicago, Zone 6, 1st phase of total of 7 apartment bldgs., incl. 3 apartment bldgs., Vincennes at 35 St., Ida B. Wells Extension. $1,950,000.

▲ **Ill., Oaklawn**—HIGH SCHOOL—School Dist. 220, 77th and Moody Sts., plans by L. F. Coleman, 6240 Kimbark Ave., Chicago, 2 story brick, steel Reavis High School, 77th and Moody Sts. $2,500,000.

▲ **Ill., Rockford**—SCHOOLS—Bd. Educ., Rockford, voted $4,000,000 bonds Nov. 3 public schools. CD 10/31/49.

▲ **Ia., Muscatine** — SCHOOLS — Bd. Educ., Muscatine, $1,100,000 bond election Dec. 1, school constr. and imprvs.

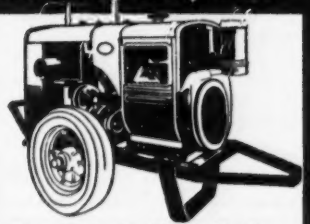
McKIERNAN-TERRY
JOB-PROVEN
Pile Hammers

McKiernan-Terry Pile Hammers are job-proven and time-tested . . . the choice of engineers and contractors on major construction projects throughout the world. Available in a standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors. Write for free Bulletin.

Also builders of coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine equipment, and specially designed machinery.

McKIERNAN-TERRY CORPORATION
MANUFACTURING ENGINEERS
13 PARK ROW, NEW YORK 38, N. Y.
MK-349

THIS "COMPLETE"
WELLPOINT PUMP
more efficient, more economical, than more costly units



We call it the "Little Giant". Contractors call it a great big boon in a compact package. This little unit, with 6" suction and discharge, handles up to 1200 gpm — may be used for open sump work, for well-pointing and for jetting "Complete" wellpoints (if you're wise) into the ground. Its 1695 pounds are mounted in a 2-wheel chassis that is easily towed behind any vehicle. Sold at a surprisingly reasonable price; Rented if you prefer it that way. Particulars are free. Write today.

COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.
36-40 11TH STREET
LONG ISLAND CITY, N. Y.

COMPLETE
WELLPOINT SYSTEMS

FOUNDATION CONSTRUCTION

CAISSONS
SHAFTS
DRILLED AND UNDERREAMED
PIERS

SPECIAL DRILLING PROBLEMS

Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

McKINNEY DRILLING COMPANY
NACOGDOCHES, TEXAS
Phones: 4-8373 - 4-8477 • P.O.Box 190

Hayward Buckets

Use this Class "E" Clam Shell Bucket for handling crushed stone, gravel, sand and other bulk materials.
THE HAYWARD CO., 40-60 Church St., N. Y.

Would you use 1925 construction equipment today? No. Why not change over and equip your jobs with modern office trailers and cut costs.

CONTRACTORS' OFFICE TRAILER
Models 24'—28' 35' Price $2100. to $3500.
Birch finish, drafting table, 2 built-in desks with letter files & drawers, other conveniences. Can offer three years' finance plan. Write for pictures and plans.

TRAILER VILLAGE SALES, INC.
8642 Pulaski Highway, Baltimore 21, Md.
Phones: Essex 2233

▲ † **Kan., Fort Riley**—HOSPITAL—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., plans by Benedick & Hines, 254 Laura St., Wichita, hospital at Camp Whiteside, $7,000,000, Ediger Eng. Co., 252 Laura St., Wichita, consult. engr. CD 7/2/51.

▲ **Kan., Kansas City**—SCHOOL—Bd. Educ., Library Bldg., plans by J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., Argentine High School addn., imprvs., $1,400,000; Elementary and Junior High School, $700,000; plans by R. E. Meyn, 2944 N. 53 St., Kansas City, Kan., elementary school, 10 and Locust Sts., $300,000; plans by Wilson & Earnheart, 1135 Minnesota St., Kansas City, Kan., Snow School, $300,000. CD 10/28.

▲ **Mich., Ann Arbor**—CITY HALL—City, Fred J. Locker, clk., city hall, $1,000,000.

▲ **Minn., St. Paul**—SCHOOLS—City, City Hall, voted $11,000,000 bonds, schools. CD 10/30/50.

▲ **Minn., St. Paul**—ATHLETIC AND RECREATION CENTER—City, City Hall, voted $2,000,000 bonds civic athletic and recreation center.

▲ **Mo., North Kansas City**—HOSPITAL—Clay County Memorial Hospital Assn., c/o Allan F. Wherritt, Liberty, hospital on 19½ acres Vivion Rd. (US 69) and Highland. $2,000,000. John Smiley, supt. St. Luke's Hospital, 44 and J. C. Nichols Parkway, Kansas City, Mo., advisor. CD 8/19, under Mo., Liberty.

▲ **Mont., Anaconda**—SCHOOL—Deer Lodge Co. School Dist., plans by Fox & Ballas, Missoula, high school. $1,100,000. CD 4/29.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 38, has not selected architect for Mary K. Simkhovitch Houses, Spring St., Avenue of the Americas, West Houston St., West Broadway. $25,000,000. (Correction—architect). CD 8/25.

▲ **O., Ashland**—SCHOOL—School Dist., High School Bldg., voted bonds Nov. 3, schools. $1,280,000. CD 9/24.

▲ **O., Coshocton**—HOSPITAL—Comrs. Coshocton Co., Coshocton voted bonds Nov. 3, hospital imprvs. and expansion. $1,600,000. CD 8/11.

▲ **O., Kettering**—SCHOOLS—Local School Dist., Kettering, voted $2,020,000 bonds Nov. 3, schools. CD 10/9.

▲ **O., Maple Heights**—SCHOOLS—Bd. Educ., 5500 Clement Dr., voted bonds Nov. 3, elementary school, Raymond St., Stafford School addn., and imprv. existing sites. $1,050,000. CD 10/28.

▲ **O., Niles**—SCHOOL—Bd. Educ., Niles, voted $2,280,000 bonds Nov. 3, school bldg. program, Senior High School, $1,200,000; remodel and rehabilitate existing bldgs., $1,080,000. CD 8/18.

▲ **O., Piqua City**—SCHOOLS—School Dist., Piqua City, voted bonds Nov. 3, schools. $1,850,000. CD 9/24.

▲ **O., Shawnee**—SCHOOL—Shawnee School Dist., Shawnee, voted bonds Nov. 3, school. $1,500,000. CD 5/9/50.

▲ **O., Van Wert**—HOSPITAL—Van Wert Co., Court House, defeated $1,000,000 bonds Nov. 3, hospital and nurses' home. CD 10/5.

▲ **O., Wapakoneta**—SCHOOLS—Wapakoneta School Bd., defeated $1,195,000 bonds schools. CD 8/11.

▲ **O., Willoughby** — SCHOOLS — Willoughby-Eastlake School Dist., Willoughby, voted $2,000,000 bonds Nov. 3, schools. CD 9/29.

▲ **O., Wilmington**—SCHOOLS—Bd. Educ., Wilmington, defeated $1,500,000 bonds schools. CD 10/20.

▲ **O., Xenia**—HIGH SCHOOL—Bd. Educ., Xenia, defeated $1,100,000 bonds Nov. 3, Junior High School. CD 9/16.

▲ **O., Youngstown**—SCHOOLS—Boardman Twp., School Dist., Market St., voted $1,200,000 bonds Nov. 3, schools. CD 8/27.

▲ **Okla., Oklahoma City**—SCHOOLS—Oklahoma Co., Court House, bond election Dec. 8, Negro schools. $1,000,000. Hodgins, Thompson & Ball, 1100 W. Main St., archts.

▲ **Tenn., Bolivar** — DORMITORY — State Mental Health Dpt., Capitol, Nashville, dormitory, Western State Hospital. $1,500,000.

▲ **Tenn., Knoxville**—DORMITORY—State Mental Health Dpt., Capitol, Nashville, men's dormitory addn. Eastern State Hospital. $1,000,000.

▲ **Tex., Amarillo**—HIGH SCHOOL—Amarillo Independent School Dist., Amarillo, plans by Dr. N. L. Engelhardt, c/o Engelhardt, Engelhardt & Leggett, 551 Fifth Ave., New York, N. Y., educational consults., and Walsh & Hazelwood and Short & Boren, Paramount Bldg., five separate 1 and 2 story masonry buildings, 115,000 sq. ft. Northeast Senior High School. $1,150,000. CD 12/22.

▲ **Tex., Houston**—SCHOOLS—Houston Independent School Dist., 1600 Washington St., elementary school for Negroes, Napoleon, Francis and Beulah Sts., $350,000; plans by Herbert Voelcker & Assocs., 1202 Dennis St., converting Dobson Elementary School into a Junior High School, $375,000; plans by Cameron D. Fairchild & Assocs., 2626 Westheimer St., elementary school, Linkwood St., in Knollwood area, $375,000; plans by C. G. Elliott, 4511 Kyle St., elementary school off Market St. in Pleasantville addn., $425,000; plans by Irving R. Klein & Assocs., 1317 Austin St., elementary school, Crestmont and Belfort Sts., $450,000; plans by Stayton Nunn, 3272 Westheimer St., new Junior High School, Zindler, Larimer and Market Sts., in Denver Harbor addn., $1,250,000; plans by Louis A. Glover 3116 Austin St., Park Place Elementary School, $325,000. Milton McGinty, 2425 Ralph St., superv. archt. on foregoing schools. CD 6/23/47.

▲ **Va., Lynchburg**—HIGH SCHOOL—City School Bd., City Hall, plans by Pendleton S. Clark, Krise Bldg., 3 story Dunbar High School addn. $1,500,000. Fraioli-Blum-Yesselman, 1214 Granby St., Norfolk, consult. engrs. CD 9/18/52.

▲ **Va., Norfolk**—HOSPITAL—Norfolk General Hospital, Raleigh Ave., plans by Vernon A. Moore, 716 W. 20 St., 9 story central wing. $2,750,000.

▲ **Wis., Brookfield**—SCHOOL—Union Free High School Dist. No. 1, R2 Box 124A, Pewaukee, voted $1,602,000 bonds Oct. 27, high school. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., and Grasswold-Johnson & Assoc., 734 N. Jefferson St., Milwaukee, Zone 2, archts. CD 10/21.

▲ **Alta., Medicine Hat**—HOSPITAL—General Office Bd., 344 Prospect Dr., plans by Rule, Winn & Rule, 11422 Jasper Ave., Calgary, 80-200-bed hospital, $1,000,000. CD 1/28.

▲ **Man., Winnipeg**—HOUSING—Municipality, City Hall, ratepayers voted in favor, housing development $1,100,000. W. D. Hurst, City Hall, city engr. CD 10/5.

▲ **Man., Winnipeg**—SCHOOL—Municipality, City Hall, ratepayers voted in favor school construction, $3,500,000. W. D. Hurst, City Hall, city engr. CD 10/5.

▲ **Ont., Brockville**—HOUSING—Municipality, housing development on 90 acre site, $3,000,000. CD 9/25/51.

▲ **Que., Montreal**—COLLEGE—Bd. Governors, Sir G. Williams College, 1441 Drummond St., plans by Ross & Assoc., Dom. Sq. Bldg., college addn. $2,000,000. CD 3/30/51.

▲ **Que., Montreal**—HOSPITAL—City, hospital and training center for Mentally Handicapped Children Incorp. $1,500,000. CD 4/28/49.

▲ **Que., Verdun**—CIVIC CENTRE, etc.—City, A. J. Burgess, city clk., combined civic center and federal bldg. (post office). $2,000,000.

COMMERCIAL BUILDINGS

▲ **Ill., Chicago**—SHOPPING CENTER—New York Life Insurance Co., 470 E. 35 St., plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Zone 3, shopping center, 17 acres on South Parkway between 31st and 35 Sts., to serve 101-acre housing proj. of owners. $10,000,000.

▲ **Ia., Waterloo**—HOSPITAL—Allen Memorial Hospital, Waterloo, hospital addn. $1,000,000.

▲ **Mich., Ann Arbor**—HOMES—Loch Alpine Development Co., A. Green, 13324 W. Seven Mile Rd., Detroit, Loch Alpine Development, 500 single homes, incl. lake and recreational facilities near here. $4,500,000.

▲ **Mich., Kalamazoo**—HOSPITAL—Borgess Hospital Bd. Trustees, plans by Schmidt, Garden & Erikson, S. Michigan St., Chicago, Ill., brick, steel hospital addn., incl. laboratory, pharmacy psychiatric dpt., heating plant facilities, $1,350,000.

▲ **Mo., Kansas City**—OFFICE, etc.—Standard Oil Co. of Indiana, c/o Harold E. Pundy, div. mgr., 40 and Main Sts., office, parking facility, Armour Blvd., 34 Terrace and Warwick St. $1,000,000.

▲ **Mo., St. Louis**—LIBRARY—St. Louis University, Very Rev. Paul C. Reinert, S. J., pres., 221 N. Grand Blvd., Zone 3, Pope Pius XII Memorial Library on university campus, $4,000,000-$5,000,000.

▲ **N. Y., Hempstead**—SHOPPING CENTER—Roosevelt Field, Inc., c/o Webb & Knapp, Inc., 383 Madison Ave., New York, Zone 17, shopping center, 130-acre tract bounded by Clinton Rd., Old Country Rd. and Stewart Ave. to center around new Macy's Store. $35,000,000. Ieoh Ming Pei, 270 Park Ave., New York, Zone 17, owners' engr.

▲ **N. Y., New Rochelle**—COMMUNITY CENTER—Beth El Community Center, 1324 North Ave., community center 4-acre site, North Ave. at Northfield Rd. $2,000,000.

▲ **S. C., Columbia**—HOSPITAL—Baptist Hospital, 1519 Marion St., plans by Lafaye, Fair, Lafaye & Assocs., 1226 Sumter St., hospital addn. $1,000,000. CD 10/26/51.

▲ **Ont., Hamilton**—BANK—Royal Bank of Canada, 360 St. James St. W., Montreal, plans by E. P. Warren, c/o owner, 6 story, bank, 28 James St. S. $2,000,000.

INDUSTRIAL BUILDINGS

▲ **Ala., Birmingham**—PLANT—Acme Steel Corp., 1727 Sixth Ave. N., plant, $2,000,000.

▲ **Ill., Morris**—FACTORY—Maytag Corp., Newton, washing machine factory. $3,000,000. Vern E. Alden, 33 N. LaSalle St., Chicago, Zone 2, consult. engr.

▲ **Mo., St. Louis**—PLANT—Mario Coil Co., 6135 Manchester St., 1 story, 400x600 ft. brick plant, $2,500,000, Brussel & Viterbo, Arcade Bldg., consult. engrs.

▲ **Neb., Omaha**—WAREHOUSE—Safeway Stores, Inc., 4 and Jackson Sts., Oakland, Calif., warehouse supply center, $8,000,000-$10,000,000.

▲ **N. Y., Kingston**—PLANT—International Business Machines, 590 Madison Ave., New York, Zone 22, plant.

▲ **N. C., Statesville**—PLANT—Southern Screw Co., Statesville, plant addn. $2,009,000.

▲ **Wash., Seattle**—PARKING GARAGE—System Auto Parks & Garages, Inc., 601 Olive Way, plans by Stiles O. Clements, 210 W. 7 St., Los Angeles, Calif., 6-level parking garage, $3,000,000. CD 4/16.

▲ **Alta., Edmonton**—PLANT—Barcam Ltd., 1718 W. 5 St., Vancouver, B. C., will not construct gas absorption plant. $8,000,000. Petroleum and Natural Gas Board refused permit. Project abandoned. CD 10/6/52.

▲ **Que., Montreal**—AUTO PARTS—Ford Motor Co. of Canada Ltd., Windsor, plans by P. Booth, 485 McGill St., 1 story, 240x1413 ft., steel, brick auto parts dpt., Cote De Liesse Rd. $1,000,000, T. Pringle & Son Ltd., 485 McGill St., consult. engrs. CD 10/15/47.

UNIT PRICES

Runway extension, California

Thirteen bidders were closely bunched in competition for a $512,434 runway-extension job at Norton Air Force Base, San Bernardino, California. The low bidder, a combination of Matich Brothers and Lowe & Watson, was less than 1% below the second low and 8.8% below the engineer's estimate. Ten other bidders were also below the engineer's appraisal.

There was an average spread of 1.2% and a maximum spread of 2.7% between each of the first twelve bids. Twenty percent separated the twelfth and thirteenth bids. The U.S. Army Corps of Engineers awarded the contract.

Work consists of a runway extension, a taxiway extension, and a railroad relocation. Seven inches of portland cement concrete will be used on the 150-ft wide, 2,500-ft long runway extension. The taxiway extension will utilize 3-in. of asphaltic concrete on its 75-ft wide, 3,500-ft long surface.

Wage rates in this area include: plasterers, $3.50 per hr; cement finishers, $2.70 per hr; and common laborers, $2.05 per hr.

The job was started September 30 and is to be finished by May 1, 1954.

Bidders include:

1C Matich Bros.-Lowe & Watson, Colton, Calif. $512,434
2 Fredericksen & Kasler-Peter Kiewit Sons' Co., Sacramento, California 513,687
13 Marshall & Haas, Belmont, California 732,158
EE U. S. Army, Corps of Engineers, Los Angeles district 562,090

Bids: 9-15-53 Items	Unit	Quantity	Unit Prices 1 C	2
Runway extension				
Stripping	cy	28,420	$0.26	$0.42
Excavation & grading	cy	141,500	0.48	0.42
Pavement removal	sy	16,000	0.36	0.25
Preparation of site	ls	1	21,400	15,000
Lower 6" CI water line	lf	487	3.50	1.70
Conc encased industrial waste line	lf	70	6.60	4.00
CI pipe, 6"	lf	825	4.85	5.00
Reinf conc pipe, 18"	lf	400	7.40	5.50
21"	lf	415	9.10	6.50
24"	lf	240	11.55	7.80
Str conc for drain struct	cy	15	110.00	94.00
reinf stl	lb	1,500	0.13	0.16
misc iron & stl	lb	2,200	0.22	0.25
Bit surf crse for ditch lining	t	52	16.50	12.50
PCC pavement	cy	8,230	11.50	12.55
Portland cement	bbl	13,400	3.60	4.10
Bit surf crse for blast pads	t	460	4.80	4.75
Asph cmt, 85-100 penetr	t	28	4.80	22.20
Bit prime coat	gal	2,110	0.13	0.13
Stab aggr base course	cy	520	4.30	5.70
Mulching & seeding	ac	50	242.00	360.00
Stripping & marking	ls	1	2,000	2,500
CI pipe, 4"	lf	50	5.30	4.20
Reinf conc pipe, 27"	lf	256	12.00	8.50
Electrical pullbox, type A	ea	2	880.00	700.00
type B	ea	7	880.00	700.00
Elec ducts, conc encased 6-4"	lf	230	9.90	9.70
4-4"	lf	725	8.25	8.00
Taxiway extension				
Stripping	cy	7,900	0.26	0.42
Excavation & grading	cy	37,700	0.48	0.42
Pavement removal	sy	30,000	0.36	0.30
Lower 6" CI water line	lf	483	3.50	1.70
Conc encased industrial waste line	lf	80	6.60	4.00
Cast iron pipe, 6"	lf	525	4.85	5.00
Reinf conc pipe, 18"	lf	400	7.15	5.50
21"	lf	415	8.65	6.50
24"	lf	490	12.30	7.80
Str conc for drain struct	cy	15	110.00	94.00
reinf stl	lb	1,500	0.13	0.16
miscell iron & stl	lb	2,000	0.22	0.25
Bit binder course	t	2,320	4.65	4.75
Bit surface course	t	2,320	4.65	4.75
Bit surface course for blast pads	t	380	4.65	4.75
Asph cmt 85-100 penetr	t	300	4.65	22.20
Bit tack coat	gal	5,700	0.13	0.17
Bit prime coat	gal	16,000	0.12	0.13
Stab aggr base course	cy	5,750	4.30	5.70
Select mat base course	cy	4,000	0.66	1.10
Mulching & seeding	ac	15	242.00	360.00
Striping & marking	ls	1	390.00	470.00
Cast iron pipe, 4"	lf	50	5.35	4.20
Electrical pullbox, type A	ea	4	880.00	700.00
type B	ea	6	880.00	700.00
Elec ducts, conc encased 6-4"	lf	370	9.90	9.70
4-4"	lf	285	8.25	8.00
Railroad relocation				
Ballast	cy	2,400	4.40	2.90
Furnish ties	ea	2,600	4.40	4.40
Install track	lf	4,710	3.50	3.15
Salvage track	lf	4,600	0.60	0.57
Stripping	cy	2,400	0.26	0.42
Excavation & grading	cy	20,000	0.55	0.42
Bit surf crse for RR crossing	t	2	27.50	8.80
Asph cmt, 85-100 penetr	t	0.12	44.00	39.00
Bit prime coat	gal	6	0.55	0.15
Rip rap slope protection	cy	4,440	4.40	4.00
Corr met pipe, 48"	lf	582	20.00	18.20
Mat base crse, selected	cy	65	2.20	1.10
Construct road block	ls	1	55.00	240.00
Reinf conc pipe, 21"	lf	80	13.75	7.00

Storm sewers, Washington

Storm sewers were installed on 0.3 miles of highway in Almira, Washington. The $20,695 contract for the job was awarded to Russell-Gillett Co., lowest of eight bidders, by the Washington State Highway Commission, W. A. Bugge, director.

The low bid was 3% below the second low and 22% below the high. An average of 3.3% separated each of the bids.

Work consisted of installing approximately 1,600 ft of 30-in. reinforced concrete pipe for a storm drain and appurtenant road work. All materials were furnished by the contractor.

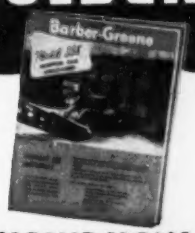
The job was scheduled for completion in 60 calendar days.

Bidders include:

1C Russell-Gillett Co., Cle Elum, Washington $20,695
2 Goetz & Brennan, Seattle, Washington 21,252
8 Goodfellow Bros., Inc., Wenatchee, Washington 26,390

Bids: 8-11-53 Item	Unit	Quantity	Unit Prices 1 C	2
Common trench exc, incl haul	cy	110	$2.00	$1.70
Structure excavation	cy	1,588	2.00	1.70
Mechanical tamper	day	18.5	35.00	40.00
Water	mgal	50	4.00	2.00
Crush stone surface, in place	cy	265	2.00	1.20
Ballast in place	cy	510	2.00	1.20
Asph cmt, no. 3	t	1	150.00	100.00
Place crush cover stone	cy	20	3.00	2.25
Conc, class C	cy	3.7	100.00	120.00
Conc or VC drn pipe, 8"	lf	18	1.50	1.00
Std RC culv pipe, 12" dia	lf	204	2.25	2.25
18"	lf	72	4.00	4.00
30"	lf	1,580	8.00	8.30
Relay conc drn pipe, 8"	lf	72	1.00	0.70
Manholes	ea	3	125.00	300.00
Remove conc headers & wing walls	ls	1	100.00	250.00
Remove timber bridges (2)	ls	1	100.00	250.00
Catch basins	ea	6	40.00	110.00

This Barber-Greene FOLDER



SHOWS HOW

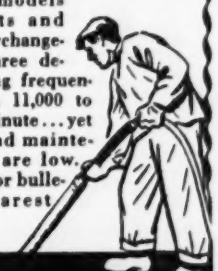
1 man can move
3 tons of material in
60 seconds with
a BG CAR UNLOADER

see your B-G distributor or write

Barber-Greene
AURORA, ILLINOIS, U.S.A.

HOW TO MAKE 1 CONCRETE VIBRATOR DO THE WORK OF 2-

A prominent user of Vibro-Plus Internal Vibrators says one Vibro-Plus does the job of two ordinary vibrators. He says his concrete tests very high—and costs substantially less. Vibro-Plus will save money for you, too—cutting your concrete time and labor costs up to 60%. There are gasoline, electric and pneumatic models (with shafts and heads all interchangeable). All three deliver vibrating frequencies of from 11,000 to 15,000 per minute... yet operating and maintenance costs are low. Write today for bulletins and nearest distributor.



VIBRO-PLUS PRODUCTS, INC
54-11 Queens Blvd., Woodside, L. I.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

December 1 Massachusetts

BIDS ASKED—BUILDINGS

▲ **R. I., Bristol**—VETERANS HOME—B.A. 12/3—Rhode Island Veterans Home, Metacom Ave., remodel and addn. to veterans home. $1,300,000. Plans deposit $100. Creer, Kent, Mather, Cruise & Aldrich, 423 Industrial Trust Bldg., Providence, archts. CD 1/6.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
M. DeMatteo Constr. Co., 200 Hancock St., Quincy, Mass. CA **$4,826,332**, est. $5,100,000. hy. and bridge Rte. 128 South Circum. Hy., U 229 (5), Needham and Wellesley;
Daniel O'Connell's Sons, Inc., 480 Hampden St., Holyoke, Mass. CA **$1,697,928**, est. $1,950,000. Contr. C state hy. and bridge South End bridge Columbus Ave., Agawam and Springfield. CD 11/9, under LB.

▲† **T. C. Bateson Constr. Co.**, 6800 Denton Dr., Dallas, Tex. CA **$4,329,000**, est. $5,000,000. 15 multi-purpose hangars, Westover Air Force Base, Eng. 19-016-54-31, CHICOPEE FALLS, MASS. U.S. Eng., 857 Commonwealth Ave., Boston, Mass. Charles T. Main, Inc., 80 Federal St., Boston, Mass., engr. CD 10/28, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Concrete Constr. Co.**, 11 Garfield Ave., Chelsea, Mass. CA **$1,811,000**. Central Junior High SCHOOL, off Broad St., East Weymouth, WEYMOUTH, MASS. Town, Elmer S. Mapes, supt. Schools, 89 Middle St., East Weymouth Mass. CD 10/27, under LB.

▲ **Frouge Constr. Co., Inc.**, 74 Goodwell St., Bridgeport, Conn., LB **$3,369,000**. Proj. B-A-A-82 ADMISSIONS and INTENSIVE TREATMENT BLDG. Fairfield State Hospital, NEWTOWN, CONN. State, R. G. Macy, P. Wks. comr., State Office bldg., Hartford, Conn. Bids Nov. 10. CD 10/6.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

December 3 New York — December 8 New Jersey

STREETS AND ROADS

December 1 Maryland — December 8 New Jersey

BIDS ASKED—BUILDINGS

▲ **Pa., Monroeville**—HIGH SCHOOL—B.A. 11/30—Municipal Auth. of School Dist. of Monroeville, P. O. Turtle Creek, 1 and 2 story, brick, block steel Junior High School. $1,800,000. Walter Schardt, 1601 Penn Ave., Pittsburgh, archt. CD 11/28/52.

▲ **N. J., Newark**—HOSPITAL—B.A. 12/1—Clara Mass Memorial Hospital, 16 Twelfth Ave., 312-bed hospital at Branch Brook Park, $3,700,000.

▲ **Pa., Greensburg**—OFFICE, etc.—B.A. 12/1—West Penn Power Co., 14 Wood St., Pittsburgh, 4 story, 212x373 ft., steel, brick and block office, warehouse and garage, Maple Ave. and Delmont Rd. $5,000,000. Hoffman & Crumpton, 700 Century Bldg., Pittsburgh, archts. CD 9/17.

HEAVY CONSTRUCTION

SOON LETS CONTRACT—BUILDINGS

▲ **NEW JERSEY**—New Jersey Hy. Auth., State Hy. Dpt. Office Bldg., 1035 Parkway Ave., Trenton,
Union Bldg. & Constr. Corp., 631 Main Ave., Passaic, N. J. LB, **$2,460,993**, Contract 86, paving 19.785 mi. Garden State Parkway from Route 30 interchange in Galloway Twp. to Westecunk Creek, Atlantic, Burlington and Ocean Counties. Bids Nov. 5. CD 10/19.

▲ **NEW JERSEY**—New Jersey Hy. Auth., State Hy. Dpt. Office Bldg., 1035 Parkway Ave., Trenton,
Union Bldg. & Constr. Corp., 631 Main Ave., Passaic, N. J., LB, **$5,089,635**. Contract No. 60, grading, drainage, paving, structures, for 2.56 mi. Garden State Parkway between Nye Ave., Irvington, and Rodwell Ave., Newark, Essex Co. Bids Nov. 9. CD 10/20.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Joseph P. Blitz, Inc.**, 150 E. 39 St., New York, N. Y. CA **$3,173,800**, general constr. Brevoort HOUSES, Proj. No. NY 5-17, Sect. II, incl. Bldgs. 7 to 13 (inclusive), in area bounded generally by Bainbridge St., Ralph Ave., Marion St. and Patchen Ave., BROOKLYN, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids Sept. 15. CD 10/1, under LB.

▲ **Shore Crest Estates**, c/o Matern & York, archts., 90-04, 161 St., Jamaica, N. Y. Owner Builds. **$2,000,000**. 78 HOUSES, Landing Rd. and Red Spring Lane, GLEN COVE, N. Y.

▲ **Jonwal Constr. Co., Inc.**, 1527 Franklin Ave., Mineola, N. Y. CA **$2,300,000**. HOSPITAL addn., Oceanside Rd., OCEANSIDE, N. Y. South Nassau Communities Hospital, 35 Oceanside Rd., Oceanside, N. Y. CD 8/20.

▲ **George A. Fuller Co.**, 597 Madison Ave., New York, N. Y., CA. Est. **$5,000,000**. Loyola SEMINARY, SHRUB OAK, N. Y. New York Province of the Society of Jesus, 501 E. Fordham Rd., New York, N. Y. CD 10/2/52.

▲ **Greenway-At-Syosset Homes**, c/o Herman York, archt., 90-04, 161 St., Jamaica, N. Y. Owner Builds. **$2,000,000**. (2nd unit), 100 HOUSES, Cold Spring Rd. SYOSSET, N. Y.

▲ **Sun Constr. Co.**, 2100 Ailor Ave., Knoxville, Tenn. LB **$4,529,000**. Pratt Street HOUSING, 490 masonry units, BALTIMORE, MD. Baltimore Housing Auth., 709 E. Eager St., Baltimore, Md. Bids Nov. 12. CD 11/2.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ky., Covington**—B.A. 12/22—Kenton County Water Dist. No. 1, 31 E. 7 St., First Phase foundations for 500,000 gal. storage tank, connecting mains, appurtenances in Kenton Lands near Erlanger. Total est. $2,000,000, Alfred LeFeber & Assoc., 2933 Woodburn St., Cincinnati, O., engrs.

▲† **Tennessee**—B.A. 1/7—U. S. Eng., 303 Federal Office Bldg., Nashville, Zone 1, power plant for Old Hickory Dam. CD 9/15, under LB.

BIDS ASKED—BUILDINGS

▲ **Fla., Coral Gables**—RESIDENCE HALL—B.A. 12/7—University of Miami, 1200 Campo Sano Ave., Julius S. Eaton Residence Hall, $1,500,000. Robert M. Little, 2180 Brickell Ave., Miami, Fla., archts. CD 5/6.

▲ **Va., Richmond**—SANITARIUM—B.A. 12/22—Medical College of Virginia, 12 and Marshall Sts., tuberculosis sanitarium and St. Philip Hospital. $3,000,000. Plans deposit $125. Baskervill & Son, 2313 W. Cary St., archt. CD 12/18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **GEORGIA**—Georgia State Toll Bridge Building Auth., 2 Capitol Sq., Atlanta,
Scott Constr. Co., Inc., Thomasville, Ga., CA, **$463,511**, two overflow bridges and 1.947 mi. approaches State Rte. 23, BA (1) 907 (7), Long Co.; CA, **$590,421**, bridge and widening existing overflow bridges, 0.746 mi. approaches, BA (1) 950-A (6) Macon Co.; CA **$397,634**, bridge, 0.185 mi. approaches, S.R. 64, BA (1) 1952 (13), Appling and Tattnall Counties;
Wright Contg. Co., 504 25 Ave., Columbus, Ga., CA, **$71,819**, bridge and 0.83 mi. approaches S.R. 11, BA (1) 1019-B (3) Walton Co.; CA **$71,787** bridge and 0.257 mi. paved approaches, S.R. 8 BA (1), 1848-A (1), DeKalb Co.;
C. L. Rhodes, Decatur, Ga., CA, **$173,926**, 2 bridges 0.632 mi. approaches, State Rte. 56, BA (1) 739 (3) Burke and Richmond Counties;
Ledbetter-Johnson Co., Rome, Ga., and **Henry Newton Co.**, Decatur, Ga., CA, **$785,709**, bridge and 0.914 mi. approaches, BA (1) 859 (7), Floyd Co.;
McMeekin Constr. Co., Cheraw, S. C., CA, **$1,227,797**, bridge over Wilmington River, 0.792 mi. approaches, State Rte. 26, BA (1) 919 (15), Chatham Co.;
H. M. Pafford, Jr., Waycross, Ga., CA, **$1,026,939**, bridge at Satilla River, S.R. 25, BA (1) 1791-B (11), Camden Co.;
H. G. Smith, Fitzgerald, Ga., CA, **$119,621**, reconstr. spans of bridge, 336 ft. approaches S.R. 27, BA (1) 1851-A (15) Telfair and Jeff. Davis Counties. Grand total $4,803,164. Bids Nov. 6. CD 10/28.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Daniel Constr. Co.**, P.O. Box 2286, Greenville, S. C. CA **$2,500,000**. Home OFFICE, GREENVILLE, S. C. Liberty Life Insurance Co., Liberty Life Bldg., Greenville, S. C.

Cecil's Inc., P.O. Box 1895, Spartanburg, S. C., CA, **$1,490,800**, (1) White Elementary-High SCHOOL: (2) Negro Elementary High School, SWAINSBORO, GA. Emanuel Co. Bd. Educ., Swainsboro, Ga. Bids Nov. 4. CD 11/11, under LB.

▲ **Escot Constr. Co.**, 434 Michigan Ave., Miami Beach, Fla., CA, **$1,250,000**, APARTMENTS bldgs., OPA-LOCKA, FLA. United Housing, Inc., 122 St., Miami Beach, Fla.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

December 8 Wisconsin

STREETS AND ROADS

December 8 Wisconsin

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus,
Soo Constructors, Inc., Winona, Minn., LB **$11,517,407**, Sect. 44, four single bridges, four twin bridges, six rein.-con. box culverts for drainage, incl. grading, drainage, structures, paving approx. 4.6 mi. from point approx. 3,000 ft. west of Oregon Rd. in Wood Co. exten. eastwardly to point approx. 2,000 ft. east of Lemoyne Rd., Wood Co.; Sect. 45, three single bridges, seven twin bridges, three rein.-con. box culverts for drainage, incl. grading, drainage structures, paving approx. 3.5 mi. from point approx. 768 ft. west of Lucas-Wood Co. line in Wood Co. exten. eastwardly to point approx. 3,000 ft. west of Oregon Rd., Wood Co.; Sect. 43, four single bridges, four twin bridges, seven rein.-con. culverts for drainage, all bridges are steel beam bridges from three to five-spans each, incl. grading, drainage, structure, paving approx. 4.2 mi. from point approx. 2,000 ft. east of Lemoyn Rd. in Wood Co. exten. eastwardly to point approx. 1,000 ft. east of Hillman Rd., Ottawa Co., Wood and Ottawa Counties. Bids Nov. 10. CD 10/12.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Morgan Constr. Co.**, 15 Belmont St., Worcester 5, Mass. CA Total cost **$10,000,000**, new ROD MILL, incl. billet storage areas and rod storage areas, Cuyahoga Heights Plant, CLEVELAND, O. American Steel & Wire Div., U. S. Steel Corp., Rockefeller Bldg., Cleveland, O. CD 11/5.

▲ **Poirot Constr. Co.**, 2001 Pershing Rd., Chicago, 9, Ill., CA, **$1,500,000**, 200,000 sq. ft. FACTORY in Crawford Ave., Central Mfg. District, CHICAGO, ILL. Hallicrafters Co., 4401 W. 5 Ave., Chicago, Ill. A. Epstein & Sons Co., 2011 Pershing Rd., Chicago 9, Ill. archt. Awarded Nov. 5.

▲ **Fidelity Builders**, 4214 N. Western St., Chicago, Ill. Owner Builds, **$2,600,000**, 175 HOMES, sewage and paving, 8200 N. Harlem Area and Main St. NILES, ILL.

▲ **American Community Builders**, 105 W. Monroe St., Chicago 13, Ill. Owner Builds, **$9,000,000**. 546 HOMES, PARK FOREST, ILL. Loebl, Schlossmann & Bennett, 430 N. Michigan St., Chicago 11, Ill., archts.

▲ **Korman & Hassin**, 22190 Westhampton St., Oak Park, Mich. Owner Builds. **$2,750,000**. 110 brick ranch HOMES, West Maple and Glengarry Rds., BLOOMFIELD, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

December 15 Texas

▲† **Texas**—B.A. 12/22—U. S. Eng., 100 W. Vickery St., Fort Worth, Turtle Creek Pressure Sewer. $1,000,000-$5,000,000. Extended date. CD 11/5.

▲† **Tex., Abilene**—DORMITORIES, etc.—B.A. 12/16—U. S. Eng., 100 W. Vickery St., Fort Worth, seven 3 story masonry 176,750 sq. ft. dormitories; two 1 story masonry 34,000 sq. ft. mess and admin. bldg., site preparation, grading, drainage, underground utilities, Abilene Air Force Base. $2,107,500. CD 12/18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **S. E. Evans**, 2914 North "O" St., Fort Smith, Ark., and **D. B. Hill**, 619 Parker St., Little Rock, Ark., LB, **$1,311,741**, est. $1,669,450, Lots 1 and 2, grading 3,000,000 cu. yd. Little Rock Air Force Base, LITTLE ROCK, ARK. U. S. Eng., 300 Broadway, Little Rock, Ark. CD 10/9.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Aton Bros. Constr. Co.**, 1571 E. Cherokee St., Springfield, Mo. CA Est. **$1,250,000**, branch STORE, SPRINGFIELD, MO. Sears Roebuck & Co., 925 S. Homan St., Chicago, Ill. Bids Oct. 7. CD 10/6.

▲ **J. M. Odom**, Box 774, Austin, Tex., CA **$1,289,000**, general constr.,
C. Wallace Plumbing Co., 1741 Old Spanish Trail, Houston, Tex., CA **$868,000**, plumbing, heating and ventilating, Brackenridge HOSPITAL addn., AUSTIN, TEX. City, City Hall, Travis Co., Court House, Austin, Tex. Bids Oct. 27. CD 10/30, under LB.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Calif., Los Angeles**—HOUSING—B.A. 12/29—Housing Auth. of City of Los Angeles, 1401 East First St., low-rent housing incl. 142-dwelling units, known as Imperial Courts Part 2-142 Unit Increment, in Imperial Hy. and Croesus Avenue area. Plans deposit $100. CD 9/18/50.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Fluor Corp. Ltd.**, 6010 Notre Dame St. E., Montreal, Que., CA, **$10,000,000**, design and construct REFINERY, BURNABY, B. C. Standard Oil Co. of British Columbia, 906 Marine Bldg., Vancouver, B. C. CD 8/28/51.

(Proposal Advertisement see pp. 64 to 66)

Government predicts 2% dip in 1954 construction volume

Commerce-Labor estimates for work put in place run close to ENR's forecast for 1954 work

The construction industry will have pretty smooth sailing next year, in the view of the U. S. Commerce and Labor Departments.

They foresee nothing more serious than a moderate decline of 2% below the record-breaking peak of $34.7 billion that will be spent this year on all types of construction put in place (table below).

Total spending on new construction next year will amount to $34 billion, according to the government estimates. Private work will account for two-thirds of the total, with an estimated cash outlay of $22.8 billion—down 3% from 1953. On public construction, the outlook is for a decline of only 1%, with 1954 expenditures expected to run $11.2 billion.

(The Commerce-Labor estimates of work put in place, show a similar trend to ENR's own forecast of Oct. 1, page 21, based on heavy construction contract awards, that the decline next year will be about 2½%.)

• **Housing given nod**—Housing—biggest single part of the construction picture, gets a better break in the Commerce-Labor estimate than pessimists have been willing to give it.

Government statisticians look for $11.2 billion of spending on private residential construction in 1954—only 4% off from this year. Even on public housing, their estimate is a bit higher than the preliminary projections of other estimators: allowing $365 million for 1954 work, a drop of 34% from 1953.

Greater construction expenditures are also expected for all utilities that serve the country's growing, mobile population. Privately owned utilities, such as railroads, power companies, telephone services and pipelines, are expected to spend nearly $4.6 billion—a rise of 3% over 1953.

Publicly owned utilities such as roads, water works, sewerage, are likewise expected to make larger expenditures during the coming year. Highway construction spending will probably amount to nearly $3.5 billion, up 10% from this year. Sewer and water construction seems pointed toward an 8% rise for 1954, to reach a level of about $825 million.

Military public works, however, probably will taper off on construction spending by 12%, to a 1954 figure of $1.2 billion. And expenditures for flood control, reclamation, navigation, also appear headed for a 10% drop.

• **Assumptions**—Statisticians of the two government departments pointed out that their estimates assume no significant change in the international situation, and continuing high levels of employment and personal income—but a slight decline in the general economy and some rise in the number of workers out of jobs. They anticipate, also, about a million new housing starts during 1954—including 25,000 public units, and expect mortgage funds will be adequate and construction costs will vary little from current levels.

• **How they estimate**—Here's how the

OUTLOOK FOR CONSTRUCTION PUT IN PLACE—'53 AND '54

Estimated by Commerce-Labor Departments
(Millions of Dollars)

Type of Construction	1953	1954	% Change '54 from '53
Total New Construction	**$34,720**	**$34,000**	**— 2**
Private, Total	**23,430**	**22,800**	**— 3**
Residential (excluding farm)	11,715	11,225	— 4
New Dwelling Units	10,345	9,650	— 7
Additions and Alterations	1,104	1,300	+18
Nonhousekeeping	266	275	+ 3
Nonresidential Building	5,689	5,575	— 2
Industrial	2,263	1,950	—14
Warehouses, Office and Loft Buildings	740	850	+15
Stores, Restaurants and Garages	1,035	1,100	+ 6
Other Nonresidential Building	1,651	1,675	+ 1
Religious	473	500	+ 6
Educational	423	450	+ 6
Hospital and Institutional	313	300	— 4
Social and Recreational	161	175	+ 9
Miscellaneous	281	250	—11
Farm Construction	1,475	1,300	—12
Public Utility	4,430	4,575	+ 3
Railroad	480	475	— 1
Telephone and Telegraph	600	625	+ 4
Other Public Utility	3,350	3,475	+ 4
Local Transit	30	25	—17
Pipeline	270	300	+11
Electric Light and Power	1,825	1,900	+ 4
Gas	1,225	1,250	+ 2
All Other Private	121	125	+ 3
Public, Total	**11,290**	**11,200**	**— 1**
Residential	551	365	—34
Nonresidential Building	4,339	4,275	— 1
Industrial	1,786	1,600	—10
Educational	1,742	1,925	+11
Hospital and Institutional	341	275	—19
Other Nonresidential Building	470	475	+ 1
Military and Naval	1,360	1,200	—12
Highway	3,145	3,450	+10
Sewer and Water	761	825	+ 8
Miscellaneous Public Service Enterprises	196	200	+ 2
Conservation and Development	833	750	—10
All Other Public	105	135	+29

government estimates are worked out. In the Labor Dept., the Bureau of Labor Statistics takes primary responsibility for statistics about private residential building and all public construction. In Commerce the Building Materials & Construction Division of the new Business & Defense Services Administration has primary responsibility for reports on all private nonresidential construction.

These agencies discuss the business outlook and construction estimates in a general way with economists and statisticians in their departments. Persons in both agencies get together informally with each other to compare notes while working up their own estimates. Eventually, the two groups meet to work out final figures, defending their own estimates and attacking what they regard as weak or unsound in the other team's figures, until all agree on a joint forecast.

There's no crystal gazing. The estimators don't work downward from any general premise for construction, based on gross national product or national income. They tackle each category separately and make a specific estimate for that item.

BLS and Commerce don't look at their estimates as the last word in construction figures. They would like to do a better job—if they could afford the people to develop a broader and more thorough base for their construction data.

Critics—with some reason—say that these estimates miss actual volume by as much as — 20%. But government statisticians argue that even if this is true their estimates do show overall trends.

Contractors bid closely on Kentucky plant

In these days of increasing competition, contractors are sharpening their pencils. Here is the bidding recently for the superstructure of a plant being built at Lexington, Ky., by the Wesson Metal Corp.:

Clarke, Stewart & Wood Co.	$107,985
Cravens & Cravens Co.	107,985
Tuttle Construction Co.	111,590
Forbes & Taylor Co.	111,800
Gibson Construction Co.	112,000
Skinner Brothers	112,250
R. D. Short Co.	140,000

The contract was awarded to Clarke, Stewart & Wood, which tied for the low bid and which already was handling the foundation and steel work.

Money may tighten

But the trend won't last long, say bond market men

In spite of signs that the municipal bond market was running into trouble, the $135-million issue sold to underwriters last week by the New Jersey Highway Authority to complete the financing of the Garden State Parkway was resold quickly to investors. The tax-exempt issue, which is guaranteed by the state, cost the authority about 2.77%. When it offered the first $150 million of the Garden State Parkway financing last July, the authority had to pay underwriters almost 3%. That's an indication of how much interest rates have eased since that time.

The way investors bought up the big Garden State issue is an encouraging sign for other local governments that are planning to raise money for construction. For, in the last couple of weeks, the steady decline in interest rates on municipal bonds that has gone on since July has started to level off.

One reason for this may be the fact that some other big issues will be coming to market soon. The Indiana Toll Road Commission plans to offer $225 million or $250 million of bonds before long. And the Massachusetts Turnpike Authority is planning to sell a $200-million issue early in 1954.

• **Corporate bonds**—In the corporate bond market, there have also been some indications that interest rates are rising a little. Several recent issues of utility bonds, bought by underwriters at high prices then reoffered to investors, have sold very slowly and at prices below the original offering price. When bond prices decline, that means interest rates are rising.

Industrial bond prices also have been weak lately. One reason for this

"Operation Facelift" gets under way in L A

To promote the "Build America Better" program of the National Association of Real Estate Boards, Los Angeles real estate men set up a rehabilitated building on Los Angeles' Wilshire Boulevard, a block from the recent NAREB annual convention site. Inspecting a "before" picture in front of the "after" results are: William A. Wells, president of the New York State Association of Real Estate Boards; Henry G. Waltemade, chairman of the Realtors Washington committee of NAREB; E. A. Becker, builder and contractor who did the facelifting job; A. H. Voelker, past president of the California Real Estate Association; and Fritz Burns, chairman of NAREB's "Build America Better" Council. The program aims at encouraging rehabilitation of the country's slums and near-slums by private and municipal efforts, a subject that got much attention at the NAREB convention.

is the recent announcement by General Motors Corp. that it will soon put out a $300-million issue, which would be the largest industrial issue ever offered publicly to U. S. investors.

Many Wall Street observers, however, believe that if interest rates go higher, the trend won't last long. They point out that the end of the year is traditionally a period when money becomes harder to borrow. This is the time when bank loans rise to their peak as businessmen prepare for the Christmas season. After Christmas, the usual pattern is for interest rates to ease up again.

Another major reason why bond market men think interest rates will not tighten up for long is this: The Federal Reserve Board is continuing its policy of keeping money easy.

Texas group buys control of Pigeon Hole Parking

A Texas businessman and associates propose to buy control of Pigeon Hole Parking, Inc., of Spokane, Wash. (ENR Aug. 13, p. 92) and build $13 million worth of units throughout the U. S. during the next 18 months.

A group headed by E. H. Robertson, of Fort Worth, has offered to buy 760,000 shares of common stock in the company at 10 cents a share, plus all of a new preferred stock issue of 1.1 million shares at $2.50 apiece.

Pigeon Hole stockholders have voted to change the company's capital structure to permit selling control to the Texas group. They authorized a change from two million shares of common, with par value of $1, to 2.2 million shares. Half of this will be common stock, par value 10 cents. The other half will be preferred, with no stated par value.

L. C. George, of Houston, an associate of Robertson's who arranged the deal, told Pigeon Hole stockholders that the Texas group planned to buy or lease land in cities with serious parking problems. The Pigeon Hole units park cars by raising them from street level to upper floors by a combination traveling crane and hydraulic lift.

George said that most of the units would be built in Texas, New York, California, Pennsylvania, and Michigan. He predicted that the company would erect units holding 18,000 cars within the next year. The average unit would hold 220 cars and use two lifts.

Pigeon Hole Parking was developed in Spokane by two brothers, Vaughn and Leo Sanders. The lifts have been built by Peters Co., of Portland, Ore., which manufactured the first model according to the Sanders brothers' instructions.

Proposed work picks up fast in first half of November

The outlook for another good year for contractors has improved this month, because of a sharp pickup in the volume of new proposed work during the first two weeks of November.

During that period, new projects estimated to cost more than $1.4 billion were reported to ENR. This is greater than the combined total of new work that went into the backlog during September and October. Indications are that November volume of proposed work may come close to this year's high of $1.9 billion in January.

This upsurge follows a monthly total of $444 million in September, and $953 million in October. The September figure was the lowest since start of 1950 (ENR Oct. 29, p. 96).

While a few large projects accounted for more than half of the work proposed in the first two weeks of November, smaller jobs made up a healthy portion of the total. Among big projects proposed this month are:

- The $315-million hydroelectric project on the St. Lawrence River by the New York Power Authority.
- $300 million worth of toll roads and bridges in Michigan.
- A $250-million extension of the Pennsylvania Turnpike.

Business briefs . . .

- **Pacific Gas & Electric Co.** expects to reduce its construction budget to an average of about $175 million during the next three years. In 1953, the company expects to spend about $190 million.

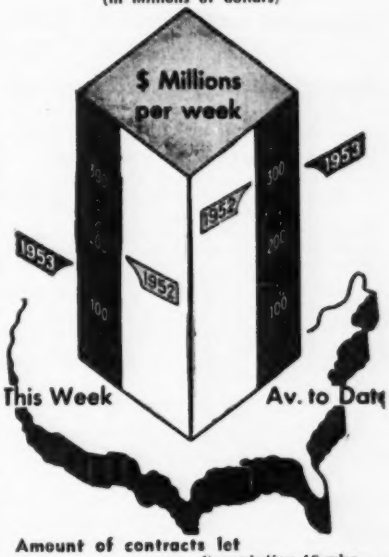
- **Idaho Power Co.** will spend $261 million for construction over the next 10 years. The company expects that use of electric power in its area will more than double by 1962.

- **Air-conditioning boom** is predicted by C. E. Buchholzer, president of Chrysler Corp.'s Airtemp Division. He thinks that by 1958 about one-half of all new homes will include year-round air conditioning.

- **Oliver Corp.,** Chicago manufacturer of construction and farm equipment, has acquired the stock of Bee-Gee Manufacturing Co., Gilroy, Calif. Bee-Gee also makes construction and farm machinery.

Activity This Week

As reported to ENR
(in millions of dollars)



Amount of contracts let

	This Week*	Cumulative 48 wks 1953	1952	% chge
Federal	$8.5	$1,341.2	$4,370.8	−69
State and municipal	44.3	4,582.8	3,829.1	+20
Total pub.	52.8	5,924.0	8,199.9	−28
Total priv.	92.3	7,735.9	6,582.4	+18
U. S. total	**$145.1**	**$13,659.9**	**$14,782.3**	**−8**
Contracts by type of work				
Waterworks	$2.4	$214.0	$206.5	−47
Sewerage	1.2	400.5	279.6	−86
Bridges	5.8	632.5	393.3	−56
Highways	19.8	1,646.2	1,345.4	−42
Earthwork, waterways	2.7	335.6	453.3	−61
Buildings:				
Public, excl. hsg.	18.0	1,577.0	4,174.9	−45
Housg., pub.	1.6	363.5	595.8	−79
Housg., priv.	40.0	3,224.8	2,782.7	−40
Commercial	4.5	1,066.9	711.5	−80
Industrial	41.9	2,609.3	2,596.3	−23
Unclassified	7.0	1,589.6	1,262.6	−79
Total	**$145.1**	**$13,659.9**	**$14,782.3**	**−49**

* 4-Day week

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Week of Nov. 19 1953	Cumulative 47 Wks 1953	% chge 1952-53
Corporate securities	$19.0	$3,811.8	+12
State and municipal:			
Excluding housing	63.3	3,854.1	+41
Housing	...	262.1	−12
Federal loans	3.4	107.4	−67
Federal aid	...	770.9	+40
Total non-federal	**$85.8**	**$8,806.3**	**+20**
Federal approp.:			
In U. S.	...	1,566.7	−79
Outside U. S.	...	28.9	−85
Total new capital	**$85.8**	**$10,402.0**	**−30**

ENR indexes	1953	Base Years = 100 1913	1926	1949
Construction cost	Nov	610.92	293.67	128.07
	Oct	610.76	293.59	128.04
Building cost	Nov	436.34	235.87	124.03
	Oct	436.31	235.86	124.03
Volume	Oct	528	215	153
	Sept	487	198	141

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY. (Except for earlier holiday closing)

Bids: December 8, 1953

Construction of Boulevard

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

FRANKLIN BOULEVARD

Construction of Franklin Boulevard from Township, Somerset County, Federal Easton Avenue to Rodney Avenue, Franklin Township, Somerset County, Federal Aid Secondary Project No. S-185(1). Length 0.227 miles. The principal items of construction are:

Estimated:
- 2,057 cu. yds. Roadway Excavation—Unclassified
- 6,197 sq. yds. 8" Macadam Base and Modified Penetration Macadam
- 822 tons Bituminous Concrete
- 2,212 lin. ft. Rein. Concrete Pipe
- 2,375 lin. ft. Concrete Curb

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, December 8, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements, and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 275 Main Street, Somerville, N. J. or 94 Carroll Place, New Brunswick, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Ave., Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

U. S. Government

Bureau of Reclamation, North Platte River District—111253-P2, Casper, Wyoming. UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Specifications No. 703C-320 for furnishing labor and materials and performing all work for the construction of Sidney Substation—Sioux Ordnance 34.5-Kilovolt Transmission Line, Missouri River Basin Project, will be mailed to P. O. Box 280, Casper, Wyoming, or delivered to the office of the Bureau of Reclamation in time for the public opening at 10:30 a.m., Mountain Standard Time, December 15, 1953, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming. Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge for copies of the specifications and drawings furnished for bidding purposes; for all others $1.00 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States.

OFFICIAL PROPOSALS

Bids: December 18, 1953

River Interceptors

PROJECT WVA 46-P-5A, UNIT ONE, SUB-SECTION 3 & 4
KANAWHA RIVER INTERCEPTORS, PATRICK STREET TO ELK RIVER
CHARLESTON, W. VA.

The Sanitary Board of The City of Charleston, Charleston, West Virginia, will receive sealed bids for "Kanawha River Interceptors, Patrick Street to Elk River" until 2 P M. Eastern Standard Time on the 18th day of December, 1953, at the office of The Sanitary Board, Room 15, City Building, at which time and place all bids will be publicly opened and read aloud.

ESTIMATED BID QUANTITIES

SUB-SECTION 3 Principal items
- 5400 lineal feet 60 inch diameter pipe sewer in tunnel, steel liner plate with concrete pipe lined and plain alternate.
- 400 lineal feet average 18" V.C.P. in tunnel regulator leads.
- 300 cubic yards regulator concrete.
- 390 vertical feet manholes.

SUB-SECTION 4 Principal items
- 3000 lineal feet 48" diameter pipe sewer in tunnel as in sub-section 3.
- 100 lineal feet 18" V.C.P. in tunnel.
- 20 cubic yards regulator concrete.
- 280 vertical feet manholes.
- Pool level or above.
- Sand or clay strata. Cores and data for contractors information will be available in two weeks. Furnished as addenda, but not guaranteed by the owner.

The successful bidder will be required to furnish a satisfactory performance bond in the amount of 100 per cent of contract.

Liquidated damages for delay will be One Hundred Dollars ($100.00) per day for each calendar day beyond the date specified in the contract.

The contract documents, including plans and specifications are on file at the office of The Sanitary Board, City Building, Charleston, West Virginia, and at the office of Settle Engineers, Inc., 2nd Floor Peoples Building, Charleston, West Virginia, where they may be examined free of charge.

Copies of the documents may be obtained by depositing Forty Dollars ($40.00) with Settle Engineers, Inc., 2nd Floor Peoples Building, Charleston, West Virginia, for each set of documents so obtained. The amount of the deposit for one (1) set of documents will be refunded to each actual bidder who returns the plans and documents in good condition within five (5) days after the opening of bids.

OFFICIAL PROPOSALS

The Sanitary Board of The City of Charleston reserves the right to reject any or all bids and to waive any informalities in bidding.

A certified check or cashier's check, payable to The Sanitary Board of The City of Charleston, West Virginia, or a satisfactory bid bond executed by the bidder and a surety company authorized to do business in West Virginia, in an amount of dollars at least equal to five per cent (5%) of the bid or an equal amount of U. S. Government Bonds, shall be submitted with each bid.

No bid may be withdrawn after the scheduled closing time for receipt of bids, for at least sixty (60) days thereafter.

THE SANITARY BOARD OF THE CITY OF CHARLESTON
By: F. Duane Hill, Secretary

Bids: December 10, 1953

Flashing and Roofing Repairs on Pier Shed, Columbia Street Pier Brooklyn, N. Y.

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M 204
PROPOSAL NO. 295

Sealed proposals for furnishing all labor, material and equipment necessary for flashing and roofing repairs on Pier Shed, Columbia Street Pier, Brooklyn, N. Y., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A. M. (E.S.T.) Thursday, December 10, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4080) will be received at Albuquerque, New Mexico, until December 22, 1953, for furnishing labor and materials for earthwork, clearing and structures for rehabilitation of drains, Unit AE-1, Middle Rio Grande Project. Location: Vicinity of Albuquerque, Valencia and Bernalillo Counties, New Mexico. Principal items are: Lump sum, items for clearing, cleaning, and for removing existing structures for various reaches of drain; 125,250 cu. yds. excavation for diversion channel from borrow, and for structures; 1,464 lin. ft. furnishing and laying 18-inch to 54-inch CMP; 12,340 lbs., furnishing and installing metal slide gates; lump sum, constructing concrete transition for bifurcation structures; and other work. Completion time 165 days. For particulars, address Bureau of Reclamation, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

Contractors Watch This Section —

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

OFFICIAL PROPOSALS

Bids: December 18, 1953

Contract C-22

OHIO TURNPIKE COMMISSION
139 East Gay Street
Columbus 15, Ohio

NOTICE TO BIDDERS

Sealed proposals will be received by the Ohio Turnpike Commission at or before 10:00 A.M., Eastern Standard Time, December 18, 1953, for the performance of Contract C-22.

The work covered by the Contract consists generally of the construction of grading, drainage, structures and paving of approximately 4.5 miles in Construction Section 22 of Ohio Turnpike Project No. 1, beginning at a point about 1,695 feet west of Race Road at Turnpike Centerline Station 865+00 in Lorain County and extending eastwardly to a point about 500 feet east of the Lorain County-Cuyahoga County line at Turnpike Centerline Station 5+00 in Cuyahoga County, and the construction of an engineer's office building on or near the site of the work.

The principal structures to be built are six reinforced concrete box culverts, seven single steel-beam bridges of from three to five spans each, three twin steel-beam bridges and one twin plate girder bridge (each twin bridge consisting of two separate but nearly identical and parallel structures). The abutments of ten bridges are to be on steel piles, and the abutments of one bridge are to be spread footings. The bents of ten bridges are to be on spread footings and the bents of one bridge are to be supported on steel piles.

Approximate quantities of the major items of construction are as follows:

Roadway Excavation	101,000 cu. yds.
Borrow	1,818,000 cu. yds.
Structural Concrete	14,300 cu. yds.
Reinforcing Steel	2,207,500 lbs.
Fabricated Structural Steel	3,139,000 lbs.
10" Reinforced Concrete Pavement	143,000 sq. yds.

Copies of the Plans and General Specifications for said Contract are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1	$ 5.00
Plans (also soil profiles and boring logs)	15.00
Cross Sections	25.00

Forms or copies of all remaining Contract Documents, including the Proposal for the above Contract; the Affidavit which must accompany the Proposal; this Notice to Bidders; the Special Provisions applying to said Contract; the Contract to be entered into with the successful Bidder; and the Contract Bond to be furnished with such Contract, will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office, on and after November 20, 1953.

All proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

The Proposal must be accompanied by a certified check or checks on a solvent bank or banks, payable to the order of the Ohio Turnpike Commission in an amount not less than $100,000. The Commission may at any time cash any such check. Each such check or the proceeds thereof will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted, a Contract will be entered into and the performance of the Proposal secured. Each such check or the proceeds thereof will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, December 18, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all proposals will be publicly opened and read.

The award of the Contract, if any award be made, will be to the Bidder whose Proposal is lowest and best for the performance of the work, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION
CC—11/13,20/53

OFFICIAL PROPOSALS

Bids: December 18, 1953

Contract C-60
Contract C-61
Contract C-62
Contract C-60 & 61
Contract C-61 & 62
Contract C-60, 61 & 62

OHIO TURNPIKE COMMISSION
139 East Gay Street
Columbus 15, Ohio

NOTICE TO BIDDERS

Sealed proposals will be received by the Ohio Turnpike Commission at or before 10:00 A.M., Eastern Standard Time, December 18, 1953, for the performance of each of the contracts enumerated above.

The work covered by Contract C-60 consists generally of the construction of grading, drainage, structures and paving of approximately 3.0 miles of Ohio Turnpike Project No. 1, beginning at a point about 1,543 feet west of the intersection of the Turnpike centerline and Alternate Route 20 at Turnpike Centerline Station 530+00 and extending eastwardly to a point about .72 miles east of the Town line between Superior and Jefferson Townships at Turnpike Centerline Station 689+00, all in Williams County, and the construction of engineers' office building and facilities on or near the site of the work.

The work covered by Contract C-61 consists generally of the construction of grading, drainage, structures and paving of approximately 5.3 miles of Ohio Turnpike Project No. 1, beginning at a point about 2,522 feet east of Ricketts Bridge Road at Turnpike Centerline Station 248+00 and extending eastwardly to a point about 1,543 feet west of the intersection of the Turnpike centerline and Alternate Route 20 at Turnpike Centerline Station 530+00, all in Williams County, and the construction of engineers' office building and facilities on or near the site of the work.

The work covered by Contract C-62 consists generally of the construction of grading, drainage, structures and paving of approximately 4.6 miles of Ohio Turnpike Project No. 1, beginning at a point on the State line between Ohio and Indiana at Turnpike Centerline Station 7+90 and extending eastwardly to a point approximately 2,522 feet east of Ricketts Bridge Road at Turnpike Centerline Station 248+00, all in Williams County, and the construction of engineers' office building and facilities on or near the site of the work.

The work covered by Contracts C-60 & 61, C-61 & 62, and C-60, 61 & 62, which cover various combinations of Construction Sections 60, 61 and 62, is the construction as above generally described for the individual Construction Sections in each combination contract.

In Construction Section 60, the principal structures to be built are three single bridges, and two twin bridges (said twin bridges consisting of two separate but nearly identical and parallel structures). All of these bridges are steel beam bridges of from three to four spans each, supported on reinforced concrete abutments and bents. The abutments of all bridges and the bents of two bridges are to be on cast-in-place reinforced concrete piles and the bents of three bridges are to be on spread footings.

In Construction Section 61, the principal structures to be built are four box culverts and five single bridges. The five single bridge structures are steel beam bridges of from four to five spans each, supported on reinforced concrete abutments and bents. The abutments of all bridges are to be on cast-in-place reinforced concrete piles and the bents of all bridges are to be on spread footings.

In Construction Section 62, the principal structures to be built are five box culverts, three single bridges, and one twin bridge (said twin bridge consisting of two separate but nearly identical and parallel structures). All of these bridges are steel beam bridges of from three to four spans each, supported on reinforced concrete abutments and bents. The abutments for all bridges are to be on cast-in-place reinforced concrete piles and the bents of all bridges are to be on spread footings.

Approximate quantities of the major items of construction for Contract C-60 are as follows:

Roadway Excavation	257,400 cu. yds.
Borrow	122,500 cu. yds.
Structural Concrete	3,170 cu. yds.
Reinforcing Steel	455,900 lbs.
Structural Steel	981,000 lbs.
10" Reinforced Concrete Pavement	81,400 sq. yds.

Approximate quantities of the major items of construction for Contract C-61 are as follows:

Roadway Excavation	422,000 cu. yds.
Borrow	32,000 cu. yds.
Structural Concrete	3,840 cu. yds.
Reinforcing Steel	521,300 lbs.
Structural Steel	791,000 lbs.
10" Reinforced Concrete Pavement	150,400 sq. yds.

Approximate quantities of the major items of construction for Contract C-62 are as follows:

Roadway Excavation	616,000 cu. yds.
Structural Concrete	3,920 cu. yds.
Reinforcing Steel	565,000 lbs.
Structural Steel	556,000 lbs.
10" Reinforced Concrete Pavement	130,600 sq. yds.

Copies of the Plans and General Specifications for said Contracts are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1	$ 5.00
Plans (also soil profiles and boring logs), per set, per construction section	15.00
Cross Sections, per set, per construction section	25.00

Forms or copies of all remaining Contract Documents, including Proposals for each of the Contracts set forth above, the Affidavit which must accompany any such Proposal, this Notice to Bidders, the Special Provisions applying to said Contracts, the Contract to be entered into with the (or each) successful Bidder, and the Contract Bond to be furnished with such Contract, will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each Proposal must be accompanied by a certified check or checks on a solvent bank or banks, payable to the order of the Ohio Turnpike Commission in an amount not less than $100,000 per Construction Section covered by the Contract on which the Bidder bids. If the Bidder shall tender bids for more than one Contract, said amount shall be not less than $100,000 per Construction Section covered by the Contracts on which he shall tender Proposals; provided, however, that if one or more Construction Sections are included in more than one Contract for which the Bidder shall tender Proposals, the Bidder need furnish only $100,000 per each such section, notwithstanding such duplication. The Commission may at any time cash any such check. Each such check or the proceeds thereof will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted, a Contract will be entered into and the performance of the Proposal secured.

Each such check or the proceeds thereof will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications, provided that if there be a forfeiture, it shall be of an amount equal to $100,000 per Construction Section covered by the Proposal with respect to which the forfeiture occurs, and any excess will be returned to the Bidder.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, December 18, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where Proposals will be publicly opened and read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION
CD—11/13,20/53

OFFICIAL PROPOSALS

Bids: December 3, 1953

New York State Road Work

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 3rd. day of December 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1 G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.				
Albany	C.T. 53-13	New York State Thruway—Catskill Section-Subd. 3A (Southern Boulevard Interchange)	....	Water Main and Sanitary Sewer	$4,000 Plans $10	$77,000
Washington	FARC 53-130	Cambridge-Salem Pt. 2, S.H. 5293 Proj. F-570(5)	0.39	8" Cem. Conc. Pavt. 22' Wide..	$5,000 Plans $10	86,000
		DISTRICT No. 8 J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.				
Rockland	H.T. 53-10 R.C. 53-121 S.T. 53-33	New York State Thruway—Hudson Section-Subd. 9A (Nyack Approach to Tappan Zee Bridge); Nyack Interchange; Access Ramps; New Jersey State Line-Nyack Pts. 3 and 4, S.H. 8136-5682; Nyack Village: Main St., S.H. 8459; Knapps Corners-Nyack, S.H. 5178 and Nine Misc. Secondary Cross Rds. Including Relocation of R.R. Tracks	4.46 Acc. 1.57 Thy.	9" Cem. Conc. Pavt. 2 @ 37' Wide = 1.57 Mi. 9" Unreinf. Cem. Var. Wd. Conc. Pavt. = 3.07 Mi. Asp. Conc. Ty. 1A, Opt. = 0.78 Mi. R.R. Relocation = 0.56 Mi. Misc. Work = 0.05 Mi. 6 Hy. Seps. Comp. I-Beams 227.2', 60.2', 180.8', 215.6', 180.3', and 290.8' R.R. Sep. Comp. I-Beam and Thru Gird. 286.3'	$400,000 Plans $100	7,721,000
Rockland	H.T. 53-12	New York State Thruway—Hudson Section-Subd. 8 (Suffern Nyack Pt. 1)	0.21	9" Cem. Conc. Pavt. 2@ 37' Wide = 0.19 Mi. Misc. Work = 0.02 Mi. R.R. Hy. Sep. Comp. I-Beams and Girders 787.2'	$156,000 Plans $25	2,850,000
Westchester	H.T. 53-13 S.T. 53-35	New York State Thruway—Hudson Section-Subd. 10 (Tuckahoe Road-Tarrytown, Pt. 2); Access Ramps; Mountain Road	0.73 Acc. 0.42 Thy.	9" Cem. Conc. Pavt. 2 @ 37' Wide = 0.42 Mi. 9" Unreinf. Cem. Conc. Pavt. Var. Wide = 0.73 Mi. Hy. Sep. Comp. I-Beams and Girder 477.3' Hy. R.R. Sep. Comp. Girder 750.3'	$180,000 Plans $50	3,309,000
Westchester	P.S.C. 4678-5777	Elimination of Grade Crossing of N.Y.C.R.R. and Mt. Kisco Village: Main Street, S.H. 865, South Street and Hubbels Crossing	1.70	8" Cem. Conc. Pavt. 30'-44' Wide = 0.29 Mi. Asp. Conc. Ty. 1A, Opt. = 0.52 Mi. Misc. Work = 0.13 Mi. R.R. Track Work = 0.76 Mi. 3 R.R. Seps. Comp. I-Beams 56.3', 60' and 124'	$90,000 Plans $50	1,667,000
		DISTRICT No. 9 F. W. Donovan, District Engineer, 71 Frederick St., Binghamton, N. Y.				
Delaware	53 BWS 2-3-3A-3B-3C-3CT-4	N. Y. City: Board of Water Supply Road No. 3 (Pepacton Reservoir) and Roads Nos 2, 4, 3A, 3B, 3C, 3CT	5.72	Bit. Mac. Ty. 1 (Pen. Meth.) = 5.70 Mi. Misc. Work = 0.02 Mi.	$95,000 Plans $25	$1,605,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: December 8, 1953

Construction of Overpass

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

PALISADES INTERSTATE PARKWAY,
SEC. 1-N
OVERPASS AT ROUTE U. S. 9W

Construction of Overpass at Route U. S. 9W, Palisades Interstate Parkway, Section 1-N, Borough of Alpine, Bergen County. The principal items of work are: Estimated:

10,420 lin. ft. Steel H. Bearing Piles
2,580 cu. yds Concrete in Structures
47,815 lbs. Reinforcing Steel in Structures
182,500 lbs. Structural Steel

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, December 8, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, 1035 Parkway Avenue, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: December 8, 1953

Paving of Bridge Approaches

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

RT. 25 (1927), U.S. 130 (1953), SEC. 2-F
BLACKS CREEK BRIDGE APPROACHES
PAVING

Route 25 (1927) Route U.S. 130 (1953), Section 2-F, Blacks Creek Bridge Approaches, Paving, Bordentown Township, Burlington County. Length 0.236 miles. The principal items of work are: Estimated:

3,100 cu. yds. Roadway Excavation-Earth
1,100 sq. yds. 7" Macadam Base
400 tons Bituminous Concrete Pavement, Type MA-BC-1 and 2
3,400 sq. yds. 10" Rein. Conc. Pavement
450 lin. ft. 18" Rein. Conc. Pipe
1,500 lin. ft. Concrete Curb

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, December 8, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, 1035 Parkway Avenue, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: December 17, 1953

Drive Chains, Pinions, Sprockets, Chain Cases, Oil Disks and Oil Pumps

THE PORT OF NEW YORK AUTHORITY
PROPOSAL NO. 296

Sealed proposals for furnishing all labor, material and equipment necessary for the supplying of chains, pinions, sprockets, chain cases, oil disks and oil pumps for the Holland Tunnel will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A.M. (E.S.T.) Thursday, December 17, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

CIVIL ENGINEERS

Work on hydro-electric power developments. Write giving full experience record, qualifications and salary desired.

HARZA ENGINEERING COMPANY
400 West Madison St., Chicago 6, Illinois

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—BUILDING Construction Estimator —By old established North Jersey Company —Must be experienced with emphasis on Industrial Construction. Must have engineering background and be able to handle the complete estimate. Excellent Salary — Profit Sharing — Opportunity to advance — Age 32-42. P-9232, Engineering News-Record.

STAFF ASSISTANT to General Superintendent for combination structural fabricating and structural steel warehousing organizing of medium size in Western Pennsylvania. Practical background in administrative controls such as production planning, scheduling, cost reports; materials storage, layout, work measurement, methods improvement. Persuasive ability to really plug ideas for improvement to "hard-to-sell" superintendent and department managers. Excellent salary and company benefits which include company paid group insurance and hospitalization, sick leave and annual paid vacation. Write giving age, education, experience, personal qualifications. P-9695, Engineering News-Record.

WANTED: CIVIL Engineer, graduate with between five and ten years general surveying experience with heavy exposure to property surveys. Permanent position offering excellent growth potentialities with firmly established company emphasizing photo grammetric engineering and cadastral mapping services. Location—Northeastern United States. Write full particulars, including education, availability, experience, career objectives, and salary requirements to P-9632, Engineering News-Record.

WANTED—RECENT civil or mechanical engineering graduates, General field of municipal water supply. Permanent position with annual increase in salary and bonus. Profit Sharing Plan. Frequent change in location necessary. P-9768, Engineering News-Record.

DRAFTSMAN WANTED—Experienced for detailing miscellaneous and/or structural steel by Bushnell Steel Company. P. O. Box 2579, Jacksonville, Florida. Reply giving brief resume of experience, education, availability, and salary expected.

ESTIMATOR—PRINCIPAL duties Quantity Take-off. Experienced on Public Works, Institutional, Educational and Industrial Buildings, Bridges and related construction. Permanent position, excellent salary. Location, Maryland, state education, experience, age, references and availability. P-9854, Engineering News-Record.

OFFICE PROJECT Engineer 30-40 for contractor specializing in competitive bidding public buildings. Position requires job expediting, purchasing, and checking details. Graduate engineer or architect preferred. Stanley W. Newman Co., Mobile, Alabama.

WANTED: CHIEF Draftsman for structural steel fabricating & ornamental iron shops. Prefer man with at least 5 years actual experience, must know drafting room and shop standards and costs, also capable of handling 10 or more draftsmen. Give resume of experience, age and salary. Write Peden Steel Company, Raleigh, N. C.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEERS—Albany, New York and Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. SW-8254, Engineering News-Record.

WANTED—SALESMAN to sell Office Trailers to Contractors. Must be experienced in selling to Contractors. Not over 40 years of age. Contact A. V. Williams, Box 145, Baltimore 20, Maryland.

(Continued on the following page)

MATERIALS INSPECTORS WANTED

By the Tennessee Valley Authority for inspection of major electrical and mechanical equipment and materials at manufacturing plants located in cities such as Birmingham, New York, Philadelphia, Pittsburgh, Milwaukee, Schenectady and Chicago.
Work includes inspection of material and equipment during all stages of manufacture, witnessing factory tests, conferring with shop officials, and preparing reports on inspection progress and test results.
Persons having experience in actual inspection work in factories producing materials and equipment used in construction of hydro and steam electric generating plants are desired.
Entrance salaries are $4575 and $5450 a year for 40 hour week. Vacation, sick leave, and retirement benefits.

Write to the
TENNESSEE VALLEY AUTHORITY
Division of Personnel
KNOXVILLE, TENNESSEE

BRIDGE DESIGNERS — DRAFTSMEN

Experience required in Structural Design and preparation of drawings for Steel or Concrete. Excellent opportunity to work on a long program including all types of Bridges. Location in Harrisburg, Penna., with excellent living conditions. Include experience and salary requirements in first letter.

Gannett, Fleming, Corddry & Carpenter, Inc.
Box 366 Harrisburg, Penna.

WANTED
EXPERIENCED GENERAL SUP'T.

On heavy construction in the East, able to take charge from estimating to completion. 15T rate only. State experience and when available.

P-9733, Engineering News Record
330 W 42 St., New York 36, N. Y.

WANTED: TUNNEL SUP'T.

By Philadelphia Concern. Experienced from bidding to completion. State qualifications and salary.

P-9730, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

STRUCTURAL STEEL DETAILERS AND CHECKERS WANTED

Pay above average, vacation with pay, steady work, modern air-conditioned offices. Company est. 33 years. Send detailed information.

THE MARYLAND STEEL PRODUCTS CO.
P. O. Box 1997
Baltimore 3, Maryland

WANTED
EXPERIENCED ESTIMATOR

On general heavy construction in Pennsylvania, New Jersey and Delaware. State experience and salary.

P-9727, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

EDITORIAL ASSISTANT

NATIONAL ARCHITECTURAL MAGAZINE
Young man with engineering or architectural background to handle new products, and technical articles. Some experience preferred. Good opportunity for advancement. State age, experience, and salary required.

P-9663, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

GOLD COAST, TEMA DEVELOPMENT CORPORATION

Vacancies exist in the Senior staff of the Corporation, which has been established by Ordinance for the purpose of planning and developing the New Town of Tema.

(1) Appointments will normally be on contract for two tours of 18 to 24 months each in the first instance, or for five years in the case of indigenous staff.

(2) Overseas officers will be entitled to seven days leave (exclusive of travelling time) on full pay for each completed month of residential service; African Senior Officers will receive five days leave on full pay for each completed month of service.

(3) Free return passages by sea (first class) or air will be provided for overseas officers each tour, and passages for a wife and up to three children under the age of 13 years will also be provided. Free rail travel to and from the port of embarkation when travelling to or from the Gold Coast is also allowed.

(4) It is intended to establish a Provident Fund, to which each officer may expect to have to contribute 10% of his salary, the Corporation contributing at least an equal amount. Pending the establishment of the Fund, gratuities will be paid as follows for each completed three months of satisfactory service.

Officers on salaries of £700-£999: £25.
Officers on salaries of £1000 & above: £37.10s.

(5) Quarters (partially furnished) are provided for overseas officers in Accra, at the following rentals:

Salaries up to £1350 — £ 60 per annum
" £1351 to £1850 — £ 75 per annum
" £1851 to £2400 — £ 90 per annum
" £2401 to £2650 — £120 per annum
over £2650 — £150 per annum

When the Corporation moves to Tema, officers will be expected to make their own arrangements.

(6) Free medical attention will be given to officers and their families.

(7) Officers required to use motor-cars in the course of duty will be paid a monthly maintenance allowance and mileage.

(8) Income Tax in the Gold Coast is at rates considerably lower than those in the United Kingdom.

Applications are invited from suitably qualified candidates for the following vacancies:

A. Chief Engineer. (Salary—£2500 p.a.)
Candidates, who must be graduates (B.Sc. (Eng.) or other recognised Engineering degree) and be Associate members of the Institute of Civil Engineers or of the Institution of Municipal Engineers, should have had considerable municipal experience or experience in New Town Development.

B. Engineers.
Vacancies also exist in the following Engineering branches: Civil, Mechanical, Electrical and Structural. Candidates must possess a B.Sc. (Eng.) or other recognized Engineering Degree i.e. a degree giving exemption from Sections A and B of the relevant Institutions examinations, or must have passed Sections A and B of the examinations of the relevant Institution and must have at least 5 years practical experience after qualifying. Municipal experience, or experience in New Towns, is desirable. The following are the relevant Institutions:

Civil Engineers:	Institute of Civil Engineers; Institution of Municipal Engineers.
Mechanical Engineers:	Institution of Mechanical Engineers.
Electrical Engineers:	Institution of Electrical Engineers.
Structural Engineers:	Institution of Structural Engineers.

or comparable foreign qualifications.
The salary for this grade is on a Scale £1000 x 40—£1200. Opportunities will arise for promotion to the grade of **SENIOR ENGINEER** in the scale £1300 x 50—£1500. In these grades overseas pay (£325-£350) is payable.

C. Chief Architect and Town Planner.
(Salary—£2500 p.a.)
Candidates must be A.R.I.B.A. and A.M.T.P.I., or have equivalent qualifications and must have had considerable municipal or New Town experience.
Vacancies also exist in the following grades viz—
Assistant Architects. (Salary—£700 x 30—£910) must be students of the R.I.B.A.
Architects. (Salary £1000 x 40—£1200) must be A.R.I.B.A., or hold a degree or diploma which is accepted as equivalent to having passed Sections A and B of the Institute's examination, and have reached the age of 28 years. Membership of the Town Planning Institute would be an advantage. Opportunities will exist for promotion to the grade of **SENIOR ARCHITECT** (Salary £1300 x 50—£1500). In these grades Overseas Pay (£175-£350) is payable.

APPLICATIONS: Persons resident in the United Kingdom and Europe should apply to the Commissioner for the Gold Coast, Melbourne House, Aldwych, London, W. C. 2. for a form of application, while other applicants should send full details of age qualifications and experience and arrange, if possible, for a testimonial from present and/ or recent employers to be sent to the Commissioner.

(Continued from preceding page)

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

DESIGN ENGINEER, 22 yrs. varied experience on large irrigation works (18 yrs. with U. S. Bur. of Recl.). Experience includes extensive hydraulic and concrete design; cost and quantity estimates; preparation of cost and progress reports; material expediting; training and supervising men in this work. Two years as Chief Design Engineer for multimillion dollar project in South America. Detailed experience record upon request. PW-9751, Engineering News-Record.

SUCCESSFUL CONSTRUCTION man, age 40, is interested in relieving you of most or all of your construction problems on grading, paving, drainage on highways, airdromes, floodwalls, etc. as top level supervisor. Reply PW-9750, Engineering News-Record.

ESTIMATOR AND Construction Superintendent on Roads, Parkways, Drainage and Sewers. Twenty-five years experience. Bidding and subcontract negotiation. Available on short notice. PW-9657, Engineering News-Record.

SUPERINTENDENT CONSTRUCTIONS, broad experience 25 years varied types of projects. Anywhere. Engineer. PW-9660, Engineering News-Record.

PROJECT MANAGER available Graduate Civil Engineer BSCE with early experience design in Sanitary field also 20 years experience South America in responsible charge construction large projects involving water works, sewers, pavements, piers, port works, foundations. PW-9662, Engineering News-Record.

STEEL SUPT. 28 years supervisory experience. Reinforced Steel setting. Structural steel erection Misc. & ornamental iron erection. Precast concrete in Fabrication and Erection, cost conscious. Prefer Houston, Texas location or Southern contractor. PW-9740, 520 N. Michigan Ave., Chicago, Ill.

STRUCTURAL ENGINEER, licensed graduate, 28 years office and field, industrial buildings, chemical plants, waterfronts, underground structures, etc., available for permanent responsible position. PW-9195, Engineering News-Record.

BUILDING CONSTRUCTION executive, field-office engineer, 25 years diversified experience, Middle Atlantic and Southeastern states. Experienced in administrative and supervisory capacity, estimating, buying, subcontracts, requisitions. Good draftsman, etc. Salary commensurate with responsibilities. PW-9758, Engineering News-Record.

ARCHITECTURAL STRUCTURAL Engineer experienced in industrial and commercial design, field supervision and estimating desires position with Architects, Engineers, or Constructors. PW-9653, Engineering News-Record.

CONSTRUCTION ENGINEER—C.E. graduate. Age 53, twenty-five years successful experience all phases large scale general construction and industrial chemical in direct supervision both in Field and Office. Top References. PW-9855, Engineering News-Record.

Executive Available . . . January 1st

Structural Steel—Ornamental and miscellaneous iron work—Prefabricated metal buildings. Metal Bldg. Products. Nationally known, thirty years experience. Best of references. Will take over management, or Sales Manager. Would like to acquire interest in right organization.

PW-9850, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty third year.
Write for free booklet—without obligation
WILSON Engineering Corp.
College House Offices HARVARD SQ., CAMBRIDGE, MASS.

Engineers—Foremen—Office Men
Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

POSITIONS WANTED

MECHANICAL ENGINEER desires foreign employment in Europe or Latin America. Age 35, married, one child. Previous Latin American experience. Spanish speaking. Over 15 years heavy experience in power, mining, construction, inspection. Presently employed by large Southwestern construction firm but available on short notice. Excellent references. Inquiries invited. PW-9747, Engineering News-Record.

CIVIL ENGINEER, single, 28, energetic. Responsible positions for 4 years as Supt. & Engineer on: housing, comm., buildings, steel & concrete, railroads, underground piping, & paving. Desires position with heavy construction contractor, U. S. or o'seas. PW-9846, Engineering News-Record.

CIVIL ENGINEER, graduate. 43 years general practice. Varied projects. PW-9843, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, Project Manager, or estimator. Over 25 years experience all types building construction. Aggressive and know costs. PW-9832, Engineering News-Record.

CONTRACTORS right-hand man; estimating, bidding, sub-contracts, purchasing, scheduling, job supervision, office management. 27 years experience all types building construction. PW-9833, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT: concrete pipe manufacturer. Considerable experience. PW-9829, Engineering News-Record.

STRUCTURAL ENGINEER, 28, PhD in CE, desires position as struct. designer or research and development engineer. 5 yrs. of experience, 3 yrs. in structural research, 2 yrs. in design and detailing. PW-9830, Engineering News-Record.

INSPECTOR—HIGHWAY and Airfield Construction. Recently completed contract in French Morocco as chief inspector of grading, drainage and paving. Will accept foreign or stateside position. PW-9835, Engineering News-Record.

CIVIL ENGINEER: Reg. graduate 30 years old. 6 yrs. varied experience in steel and concrete design and field inspection. PW-9828, Engineering News-Record.

SURPLUS
Drafting Machines, Levels, Transits, and Related Items
NEW and USED

Special! **NEW DRAFTING MACHINES**
Complete with Scales.
$150.00 Value—ONLY **$39.50**

Bargains in Universal "Boardmaster", Vemco, Bruning, and others.

New Transits . . $297.50
New Levels . . . $179.50

Many Good Buys in Field and Office Equipment. Shipping Charges Prepaid.

Write for Catalog

SKYLINE DISTRIBUTORS INC.
2033 Grove St., Denver 11, Colorado

FOR SALE
Chicago Pump Company Fire Pump
Rated at 750 GPM—204 foot head—at 1750 RPM with 75 HP-220 volt 3 phase—induction motor with drum controller.
CONGRESS BLDG., INC.
Phone 3-3061 Miami, Fla.

FOR SALE
KOEHRING SHOVEL
Model 605, S/N C-5821 powered with Cat. D13000 with two Esco 1½ yd. buckets. $22,500 FOB car.
L. G. EVERIST, INC.
Sioux Falls, So. Dak.

Walking draglines, Monighan 3 to 12 yards (7).
Whirley portal gantry cranes (3), 35-50 tons.
Locomotives, 7 to 80 tons (9); diesel, gas.
Diesel-elec. generator sets, 1000, 520, 400 KW.
Marine diesel engines, 1600, 950, 320 HP.
Sterling 600 HP marine gasoline engines (2).
Shovels, draglines, cranes, 1½ to 18 yds.
Euclid rear and bottom dump trucks (18).
Rock crushers—42T Drill—Dryers—Track Cranes.
H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

WINTER LINERS FOR ALL WORKERS

WARM KNITTED CAPS Reg. $24 Dozen NOW! **$1.** EACH Mailing 10¢ ea.

SNUG FIT COVERS, EARS, HEAD, NECK

Leading 'em All-Low Prices—Plus Quality

TARPAULINS

Water & Weather Treated—Brand New Canvas.

Double Stitched & R'f'c'd. with Grommets.

Sizes Stocked: 8x10-10x12-12x15-15x20-20x20
Numbers below show weight after treatment

#12	#15	#18	#22
8¢	9¢	10¢	12¢

Prices are sq. ft.—Cut Size
Billed to Rated Firms, FOB S/P.—No COD's

PARKER SAFETY ENGRG. CO.
785 Lyons Ave. Irvington, 11, N. J.

FOR SALE
New Dresser Couplings At a Tremendous Saving

190—Coupling 12" C.I. pipe, style #38 ⅝ x 7" M.R. W/O stops, complete W/H.D. bolts, W/O gaskets. Price: **$8.00 ea.**

18—Couplings 44", Steel pipe, style #38, ⅝ x 10" middle ring, W/O stops, complete with hot-dip galvanized bolts, and nuts, W/O gaskets. Price: **$40.00 ea.**

34—Steel pipe armored coupling 44" gaskets, style #38, grade #27. **Price: $6.00 ea.**

DALTON SUPPLY CO.
719-16th Ave., Belmar, N. J.

FOR SALE
1½ Yd Bucyrus-Erie Shovel

Model 38-B, S/N 38B-79079, 20' Boom, 17'5" Handle, 1½ Yd Dipper, D-13000 Diesel Motor with gas starter engine, run 2730 hours, Power Boom Hoist, 45' Crane Boom with 20' insert, Fairlead, 2500# Counterweight. Crane Boom, Counterweight and Fairlead never used. Caterpillar Mounting, length 13'7", width 10'6", Treads 33'. New Nov. 1950, seen light service.

Frowine Construction Corporation
821 Prospect St. Portsmouth, Ohio
Telephone 3-4451

5—LaPlante-Choate Motor Scrapers Model TS-300. These machines are about three years old and are in very excellent condition
1—TL-20 Lorain Backhoe
1—Bucyrus-Erie 22-B Crawler Crane.
VILBRO EQUIPMENT CO.
233 North Ave. Westfield, N. J.

FOR SALE
PILE HAMMER
9B3 McKiernan-Terry Pile Hammer in excellent condition.
FS-9842, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

GRAVEL DEPOSIT AVAILABLE AS JOINT BUSINESS VENTURE

Gravel Deposit of 23 Acres Available 25 Miles from Boston

20 Acres More Under Option

70% Stone—30% Sand—Meeting Highest Tests

Thompson & Lightner reports available

WANTED

TO PURCHASE AND OPERATE ON A 50-50 BASIS SAND AND GRAVEL CRUSHING AND WASHING PLANT—NEW OR USED —WITH 2 CRUSHERS TO PRODUCE 600 TO 800 TONS DAILY.

Property located on Route 85 in Southboro. Three miles from Framingham line

WANTED ALSO

A READY-MIX CONCRETE COMPANY TO SET UP PLANT ON OUR PROPERTY, ON RAILROAD SIDING, 1 MILE FROM DEPOSIT, TO WHOM WE WILL SELL AGGREGATE ON LONG TERM BASIS.

Tests and borings assure 800 gallons of water per minute. All zoning laws and necessary permits compiled with.

Have you any good crushers, shaker screens, conveyors or belting for sale?

New proposed Toll Road to pass within 400 yards from our deposit. Centrally located twenty miles from Newtonville, Worcester, Waltham and Franklin.

Large deposit suitable for Hot Top Plant

This location would also be ideal for a concrete block manufacturing plant and a concrete pipe manufacturing plant as both of these industries are booming here.

Ideally located for furnishing materials for Toll Road.

***Also* 60 acres of fill on site of proposed Toll Road**

FRAMINGHAM SAND & GRAVEL CO., INC.

83 CONCORD ST., FRAMINGHAM, MASS.

Tel. Wellesley 5-2044 Evenings

FOR SALE

New and Used material—Immediate delivery from stock Angles, Channels, I and WF Beams, especially for Contractors needs

H BEAMS PILE SECTIONS

60 pcs 12" B P S 53# 60'
16 " 12" B P S 74# 75'
16 " 10" B P S 57# 67' 6"
34 " 10" B P S 42# 48'
23 " 10" B P S 42# 60'

Phone or Wire your steel requirements

We are also interested in purchasing your surplus material.
We assure you our prices will be the best obtainable.

HY DRACHMAN STEEL CORP.

Warehouse
14-23 34th Avenue, Astoria, New York
AStoria 8-4484 8-8023

Sales Office
563 East Tremont Ave., New York City, N. Y.
CYpress 9-5440

LATEST MODEL

EQUIPMENT BARGAINS

1953 Wayne Pullshovel—Crane—Dragline Model 66 half-yard capacity, 24 in. crawlers, Waukesha Engine, 2-speed transmission, new July, used two months.

Two Cleveland Model 140 Trenchers, Option 4, new May, 1953, used three months.

One WK-80 Joy 315 two-stage Air Compressor on four pneumatic-tired wheels, with International Harvester Diesel Engine. New machine that was in rental service only, in guaranteed mechanical condition.

All above at a saving of about 40-50% of the price new. Subject to prior sale.

HUNTER TRACTOR & MACHINERY CO.
327 So. 16th Street Milwaukee 3, Wisconsin

DEPENDABLE USED MACHINES

Special:—Several Bay City ¾ yd. draglines, built 1940-1948; attractive prices. Come see them!

Bay City 1¼ yd shovel
Lorain ¾ yd. shovel
Byers ½ yd. shovel
Butler Carscoop
Gallon motor grader
Lorain ½ yd. dragline; swamp tracks
Hopto backhoe on Chev. truck
Cedar Rapids 40 x 20 roll crusher
45 ton, 3-comp., port. steel bin
Several rebuilt 2-deck screens
Diamond 9 x 18 crusher
40' bucket elevator
Le Roi VPI engine
1½ KW light plant
Eagle cinder crusher

For rent—cranes, draglines, backhoes, buckets, and all other accessories.

10002 Southwest Highway **TRACTOR & EQUIPMENT CO.** Oak Lawn, Ill.

CONTACT SULPHURIC ACID PLANT TO BE COMPLETELY DISMANTLED
BUILDINGS, EQUIPMENT, VALVES, INSTRUMENTS, ETC.
Call, Write or Visit
BALTIMORE CONTRACTORS, INC.
(at DuPont Grasselli Plant)
LINDEN, N. J. PHONE: HUnter 6-0992

PIPE

SURPLUS NEW and USED FOR SALE

FOR SALE

SIX—500 CU. FT. INGERSOL-RAND DIESEL DRIVEN AIR COMPRESSORS

Mounted on Pneumatic Tires—Good Condition

CONTRACTORS TRADING & EQUIPMENT CORP.
232 FULTON ST - N.Y. 7, N.Y. BArclay 7-3940

Pipe Sizes ⅛" to 72" OD

CUTTING-THREADING-FLANGING-WELDING
BEVELING-BENDING-COILING-LINING
TO ALL STANDARD SPECIFICATIONS

PIPE, VALVES & FITTINGS
pipe piling • culverts • valves
specialists in prefabricating pipe

"one call gets them all"

fittings • FLANGES • WELDING • IRON-STEEL

SPEEDLAY pipe systems

ALBERT PIPE SUPPLY CO., INC.,
Berry at North 13 Sts., B'klyn, N. Y.

FOR SALE
BEARING PILES
76 Pieces 10" BP 42# 48'0
26 Pieces 12" BP 53# 62'0
7 Pieces 21" WF 73# 42'0

QUEENSBORO STEEL CORP.
P. O. Box 1376 Wilmington, N. C.
Phone 5528—5711

CLASS A-50

ASBESTOS CEMENT PIPE

18 in. . $1.50 ft.
(462 feet available)

20 in. . $2.00 ft.
(2684 feet available)

16.4 foot lengths with Simplex Couplings

F.O.B. New Orleans

SUITABLE FOR WATER, OIL GAS OR SEWAGE

Can be seen in warehouse in New Orleans

WRITE, WIRE OR PHONE

THE CLARK-AIKEN CO.
LEE, MASSACHUSETTS

FOR SALE—*Immediate Delivery*

C.I. Water Pipe and Fittings—AWWA Standard

We specialize in pipe and fittings which are hard to get, having in stock such as the following:—

2000 linear feet 30" Class B—Pit Cast—Class B in 12 ft. lengths—Re-conditioned

5 Lengths 60" B&S Pipe, Cl. D. 12' long
3—60" x 24" Solid Sleeves, Cl. D.
1—60" B&S 45 deg. Bend, Cl. D.
20" to 36" B&S 45 deg. Bends
3" to 30" Y-Branches—Type 2

Also C. I. B&S Pipe from 2" to 36". C. I. Flanged Pipe from 3" to 24". Always on hand a complete line of C. I. Fittings—all sizes and kinds.

TAGCO, INC.
111 Front St. Hempstead, L. I., N. Y.
Tel.—Hempstead 2-5535 or 2-8857

FOR SALE
2 BAY CITY SHOVELS
Mod. 45 With crane boom and back hoe attachments—Reconditioned

N. D. MASELLI CORP.
Tel. Newburgh 2965 Newburgh, N. Y.

RAILS-TIES

TRACK ACCESSORIES
NEW and RELAYING

EST. 1904

DAVIDSON PIPE COMPANY INC.

ONE OF THE LARGEST STOCKS IN THE EAST

Seamless and Welded ⅛" to 26" O.D.
All wall thickness Manufactured.
Specialty large sizes.
Cutting — Threading — Flanging — Fittings — Valves.

Call GEdney 9-6300
50th St. & 2nd Ave., B'klyn 32, N. Y.

NEW—RAILS—Relayers

All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mine equipment carried in stock.

M. K. FRANK
480 Lexington Ave. Park Bldg.
New York, N. Y. Pittsburgh, Pa.
Reno, Nevada Carnegie, Pa.

RAILROAD Cross and Switch TIES

Promptly from adequate stocks
NEW and USED *(as available)*

GILLIS & COMPANY
29 East Madison St. Chicago 2

GLOBE PIPE & FITTING CO.
VALVES FITTINGS NEW **PIPE** USED FOR ALL PURPOSES
785 Metropolitan Ave., Brooklyn 11, N. Y.
EVergreen 7-6220

When you need PIPE . . . fast

use this section, as many contractors do, as a pipe buying directory. It can save you time when you want to know, quickly, where to buy good new or used pipe.

RAILS
NEW — RELAYING — TRACK ACCESSORIES
MIDWEST STEEL CORP.
502 DRYDEN STREET
CHARLESTON, W. VA.
IMMEDIATE DELIVERY

FOR QUICK, DEPENDABLE

COMPRESSOR

SERVICE

AMERICAN AIR of JERSEY

GAS • DIESEL • STEAM • ELECTRIC

SELL—BUY—TRADE—RENT—REPAIR

A RENTAL COMPRESSOR FOR EVERY JOB

55 CFM Lindsay (GAS) Portable
60 CFM Worthington (GAS) Portable
70 CFM Smith (GAS) Portable
89 CFM 6 x 7 Worthington HB, 15 HP Elec
105 CFM Worth-IR-CPT Portable
107 CFM 7-7 x 7 Ingersoll FS-1 STEAM
129 CFM 7½ x 7 American AF-1, 20 HP
160 CFM IR-Worth Portable
165 CFM Smith 110SR Semi-Portable, 25 HP
194 CFM Worthington Semi-Portable, 40 HP
195 CFM 8-9 x 9 Worthington HS STEAM
210 CFM Worthington (GAS or DIESEL) Port
211 CFM 9 x 9 Worthington HB, 40 HP Elec
279 CFM 11-10 x 11 Worthington HS STEAM
294 CFM 10 x 12 Worthington HB, 50 HP
315 CFM Worthington (GAS or DIESEL) Port
388 CFM Worthington Semi-Portable, 75 HP
445 CFM Gardner Semi-Portable 75-100 HP
462 CFM 12-14½ x 13 American AF-S STEAM
500 CFM Worthington (DIESEL) Portable
538 CFM Worthington Semi-Portable, 100 HP
600 CFM Worthington (DIESEL) Portable
628 CFM 14 x 13 Ingersoll ES-1, 100 HP

MANY OTHERS TO CHOOSE FROM

GUARANTEED PERFORMANCE

COMPRESSORS SINCE 1902

AMERICAN AIR COMPRESSOR CO.

Dell Ave. & 48th St. North Bergen, N. J.

UNion 5-4848

FOR RENT

3—Brand New

Manitowoc 3000B Cranes

with 2 yd shovel fronts

DICK CONSTRUCTION COMPANY

Large, Penna. (Pgh. District) Elizabeth 1290

SURPLUS EQUIPMENT

FOR SALE OR RENT

With Option to Purchase

Rebuilt—A1 Condition

1 48B Bucyrus Erie Shovel 2 cy diesel
1 Model 6 N.W. Shovel 1½ cy diesel
1 Caterpillar D8 Bulldozer
1 New Shovel Front for Model 6 N.W.
1 Used Shovel Front for Model 25 N.W.

WILLIAMS CONSTRUCTION COMPANY

Box 145 Balto, 20, Md. Phone—Murdock 6-6600

FOR SALE

MANITOWOC DRAGLINES Model 4500

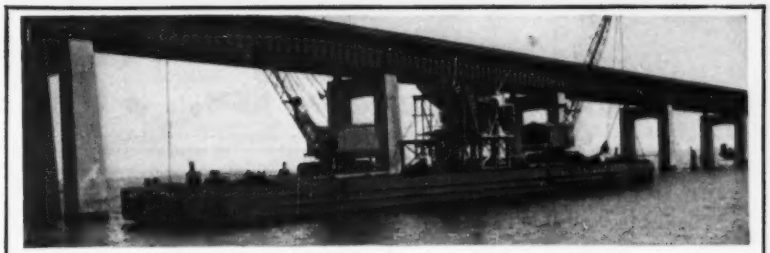
FOR SALE or RENT

Manitowoc Model 3500 Liftcrane. Clamshell, Dragline combinations. 2½ cu. yds., 60 ton capacity.

Reply to

Clemens Construction Co.

P. O. Box No. 266, West New York, N. J.



Hughes steel barge on the job at Captree Parkway Bridge

Floating Plant for Contractors Available

Modern floating equipment designed for economical, efficient and time-saving operations on large and small jobs.

Contractors: Consult us about work boats, tugs, scows adaptable for derricks, etc. when making up your next bid. We have 60 years' experience in chartering and selling floating equipment.

HUGHES BROS., Inc.

Clearing House for Marine Difficulties Since 1894

17 Battery Place *Tel. WHitehall 4-1048* **New York 4, N. Y.**

FOR SALE

Located in our Yard, Cleveland, Ohio, in excellent condition subject to prior sale:

6—25 YD. R. U. LeTOURNEAU SCRAPERS, overhauled, tires good, Serials S9062, S9519, S9643, S9656, S8991, S8992, $4500.00 each.

1—MODEL 9 BV EUCLID LOADER, Serial 9 BV-121, powered with GMC Diesel 671 RA 63-6A-9046, completely overhauled and good as new. Has new belt never used. Price $18,000.00.

1—6 TON BROOKVILLE DIESEL LOCOMOTIVE 36" gauge, International UD9 Engine 5 speed transmission, 20" rolled steel wheels, mechanical brakes, gas starting engine, electric lights, enclosed cab, used 3 months, price $1500.00.

Call Mr. Fuller Grund, Broadway 1-7860

THE HUNKIN-CONKEY CONSTRUCTION COMPANY

3459 E. 52nd Place **Cleveland, Ohio**

FOR SALE

STEEL FRAME BUILDING

ALL-CLEAR SPAN

60′ X 260′

- **Includes Crane Runways 36′6" Head Clearance**
- **Modern Design Steel Trusses 20′ on Center**
- **Building has Monitor Roof**
- **Can be inspected prior to dismantling**
- **For further information write, wire or phone (Collect) at once**

CUYAHOGA WRECKING CO.

12645 Greenfield Rd., Detroit 27, Michigan

Phone VErmont 8-1055

PILING

SURPLUS NEW and USED **For Sale or Rent**

STEEL SHEET PILING

Available from stock. Will also roll to size and specifications.

LARSSEN Arch Web

High section modulus • Very great durability • Great longitudinal strength • High rigidity • Uniform interlock

UNION Straight Web

For cellular construction
High interlocking strength

Let us design your sheet piling structure ECONOMICALLY.

KURT ORBAN CO., INC.
205 East 42nd St., N. Y. 17, N. Y.
Phone: MU 4-7700

STEEL SHEET PILING

We do a Nation-Wide business in

STEEL SHEET PILING

IMMEDIATE SHIPMENT

1900 pcs. 72-16 ft. Carn. MP-101-West Coast
164 pcs. 60-50 ft. M-116 & M-115-Illinois
95 pcs. 60-30 ft. Beth. DP-2-New York
139 pcs. 30 ft. Inland I-23-Kentucky
112 pcs. 40 ft. Larson 11-Alabama

Other lengths & sections used & new at other locations in United States for rent.
We have Nation-wide reputation for effecting QUICKEST SHIPMENTS
All sizes Vulcan & McKiernan Pile Hammers & Extractors for rent—Shop Rebuilt
Regardless of location of job, Wire, Write, or Phone

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., Chestnut 4474 St. Louis, Mo.

STEEL SHEET PILING

260-Pcs. 39-40 Ft. M-115 So. Dokato
350-Pcs. 35-39 Ft. M-112 Kansas City
100-Pcs. 30-35 Ft. I-27 Kansas City
107-Pcs. 24-65 Ft. M-112 North Dakota
200-Pcs. 27-30 Ft. M-116 Kansas
100-Pcs. 24-25 Ft. M-115 Kansas
109-Pcs. 17-20 Ft. M-112 Kansas City

Available for prompt shipment
Other lots at various locations

CONTRACTORS MACHINERY COMPANY
Phone Valentine 4740
2637 SW Blvd Kansas City 8, Mo.

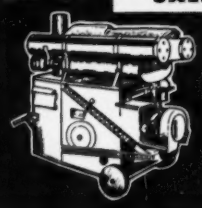
RENT STEEL SHEET PILING

"Faster From Foster"—the exact lengths and sections — all standard makes—of Rental Piling to meet your job needs. Also Rent: Pile Hammers and Pile Extractors.

RAILS • TRACK ACCESSORIES • PIPE • WIRE ROPE
L. B. FOSTER CO.
Pittsburgh 30, Pa. New York 7, N.Y.
Chicago 4, Ill. Houston 2, Tex.

HEAT

PORTABLE HEATER SALE!



108 FEET OF DUCTS INCLUDED!

250,000 B.T.U. PORTABLE HEATER & DRYER

SALE PRICE $199

Herman Nelson portable, powerful 250,000 B.T.U. gasoline or oil burning heaters with turbine-type blowers. 1½ h.p. air-cooled, ball bearing engine. 108 ft. of flexible, flameproof, waterproof ducts.

HEATING buildings under construction, shops, sheds, warehouses, barns, tunnels, hangars, spot-heating, etc.

DRYING concrete, plaster, mortar, paint, etc. Torrid blasts of heat.

PRE-HEATING engines, tractors, trucks, freight cars, equipment.

THAWING machinery, freight cars, tanks, pipelines, frozen areas, etc.

IMMEDIATE DELIVERY • SATISFACTION GUARANTEED OR PURCHASE PRICE REFUNDED
WIRE OR PHONE COLLECT • Your Heater can be shipped within 1 hour
Send for literature

BERNSTEIN BROS.
Since 1890
164 N. Mechanic St. Pueblo, Colo.

PILE DRIVING EQUIPMENT

VULCAN

new-used rental-sale
50-C 30-C #1 #2
800-A 400-A
complete parts stock

McKiernan-Terry Rental Only
9B3-2, 7, 6, 5, 3, E4
phone wire write

HOWARD W. READ Corp.
FUlton 9-4445 *Phila. 46, Penna.*

WANT BUY

ALL SECTIONS
STEEL SHEET PILING
PILE HAMMERS & EXTRACTORS

DARIEN CORP.
60 E. 42nd St. New York 17, New York

LOW COST INSTALLATION AND OPERATION

CABLEWAYS

IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT or BUY

FOR DAMS BRIDGES BREAKWATERS FILTRATION AND SEWERAGE PLANTS

FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE NEW YORK

FOR SALE

STEEL SHEET PILING

AT CHIEF JOSEPH, WASHINGTON
Shipped New—Used Only One Job

CARNEGIE Length	MP-101 Pcs.	MP-102 Pcs.	TEES Pcs.
72-65 ft.	105	100	2
65-60 ft.	210	50	9
60-50 ft.	210	5	18
50-45 ft.	290	2	7
45-40 ft.	120	1	13

Also quantity shorter than 40 ft.—Quick shipment regardless of job location, write, wire or phone.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., *CHestnut 4474*, St. Louis 1, Mo.

STEEL SHEET PILING

900 TONS ALGOMA B6—30 FT. CANADA
300 PCS. U.S. MP-101—Y-PCS. 56 FT. IN ILL.
498 PCS. U.S. MP-101—56 FT. IN ILL.
150 PCS. U.S. M-116—45 FT. IN FLA.
244 PCS. BETH. DP-2—25 FT. IN N. Y.
382 PCS. BETH. AP-3—20/25 FT. IN PA.
128 PCS. BETH. DP-2—60 FT. IN OHIO
168 PCS. BETH. DP-2—40 FT. IN N. J.

FOUNDATION EQUIPMENT

E-4 McK. TERRY PILE EXTRACTOR
15 McK T. HAMMERS 11B3—10B3—S8—S5 & No. 5
9½ x 10 LAMBERT 3 DRUM STEAM HOIST

R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.

FOR SALE

48B BUCYRUS ERIE SHOVEL 2½ YDS.

Completely Overhauled
$24,000.

J. C. McDONALD
Box 145, *Murdock 6-6600*, Baltimore 20, Md.

PUMPCRETES

Rebuilt Current Models
For Sale or Rent

CONCRETE EQUIPMENT COMPANY
312 E. Wisconsin Ave.
Milwaukee 2, Wis.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on following pages

NEW ENGLAND

Jackson & Moreland

Engineers and Consultants

Utilities and Industrials

Design and Supervision of Construction
Reports—Examinations—Appraisals
Machine Design—Technical Publications

Boston New York

Chas. T. Main, Inc.

Engineers

Design and Supervision of Construction for Industrial Plants
Electrical, Steam and Hydraulic Engineering
Investigations, Reports and Appraisals
Chamber of Commerce Bldg.
80 Federal St., Boston, Mass.

Metcalf & Eddy

ENGINEERS

Investigations Reports Design
Supervision of Construction and Operation
Management Valuation Laboratory

1300 Statler Building, Boston 16

C. W. Riva Co.

Engineers Edgar P. Snow

Highways, Bridges, Tunnels, Airports, Foundations, Sewerage, Water Supply, Reports, Design and Supervision.

511 Westminster St. Prov. 3, R. I.

MIDDLE ATLANTIC

Greer & McClelland

Consulting Foundation Engineers

SOIL INVESTIGATIONS

Borings
Laboratory Tests
Foundation Designs & Analyses
Reports

98 Greenwood Ave. Montclair, N. J.
2649 N. Main St. Houston, Texas

Edwards, Kelcey & Beck

Reports, Design Supervision, Expressways, Port & Harbor Works, Terminals, Tunnels, Bridges, Water Supply, Industrial Plants, Traffic and Management Studies.

3 William Street 250 Park Avenue
Newark 2, N. J. New York 17, N. Y.

Porter, Urquhart & Beavin

O. J. Porter & Co.
Consulting Engineers
Airports-Highways-Dams-Structures
Foundations-Stabilization-Pavements
415 Frelinghuysen Ave., Newark 5, N.J.
76 Ninth Ave., New York 11, N. Y.
3568 West Third St., Los Angeles 5, Calif.
516 Ninth St., Sacramento 14, Calif.

W. W. Slocum & Co.

ENGINEERS

Industrial - Design - Management
National Newark Building
744 Broad St., Newark 2, N. J.

Boswell Engineering Company

Engineers — Surveyors

Topographic, Highway and Property Surveys, Tax Maps, Design, Supervision, Highways, Industrial Buildings, Sewers, Garbage Disposal Municipal Improvements, Airports
Ridgefield Park, New Jersey
Phone Diamond 2-6347

Frank E. Harley and Associates

Consulting Engineers

Design, Surveys, Plans and Construction Highways, Sewerage and Sewage Treatment, Water Supply and Purification, Municipal Problems.
Harley Bldg., 260 Godwin, Wyckoff, N. J.

E. Lee Heidenreich, Jr.

Consulting Engineers

Quarries Plant Layout
Crushing Plants Design
Milling Plants Appraisals

75 Second St. 9 So. Clinton St.,
Newburgh, N. Y. Chicago 6, Ill.

Ammann & Whitney

Consulting Engineers

Design — Construction Supervision
Bridges, Buildings, Industrial Plants, Special Structures, Foundations, Airport Facilities, Expressways.

76 Ninth Avenue, New York 11, N. Y.
724 E Mason Street, Milwaukee 2, Wis.

Barker & Wheeler

Water Supply Utility and
Sewerage Industrial
Sewage Disposal Valuations
Power Systems Reports

New York City, 11 Park Place
Albany, N. Y. 36 State St.

Clinton L. Bogert Associates

Consulting Engineers

Water and Sewage Works
Refuse Disposal Industrial Wastes
Drainage Flood Control

624 Madison Ave., New York 22, N. Y.

Bowe, Albertson & Associates

Engineers

Water and Sewage Works—Industrial Wastes—Refuse Disposal—Municipal Projects—Airfields—Industrial Buildings—Reports—Designs—Estimates—Valuations—Laboratory Service.

110 William St., New York 7, N. Y.

Brown & Blauvelt

CONSULTING ENGINEERS

Industrial Plants
Bridges, Dams, Airports
Expressways, Parkways, Highways

Preliminary Reports
Engineering Design
Construction Supervision
Material Controls & Testing

Municipal Engineering Services
Tax Maps, Surveying

488 Fourth Ave., New York 16, N. Y.
140 Eighth Street, Pittsburgh, Pa.

Buck, Seifert & Jost

Consulting Engineers
(Formerly Nicholas S. Hill Associates)

Water Supply — Sewage — Hydraulic Developments, Reports and Valuations, Chemical and Biological Laboratories.
New York City, 112 E. 19th St.

Cotton, Pierce, Streander, Inc.

Associated Engineering Consultants

Water Supply, Treatment, Distribution
Sewage, Sewage Treatment
Refuse Disposal, Trade Wastes
Power Plants
Reports, Plans, Supervision

132 Nassau St., New York, N. Y.
PO Box 198, Hyde Park 36, Mass.
1405 W. Erie Ave., Phila. 40, Pa.
55 Caroline Rd., Gowanda, N. Y.

Ebasco Services Inc.

ENGINEERS
CONSTRUCTORS
BUSINESS CONSULTANTS

Design and Construction
Financial and Operating Consultation
Investigations and Reports
Consulting Engineering

Two Rector Street New York
269 S. LaSalle Street Chic. 4, Ill.
1625 I Street, N.W. Wash. 6, D. C.

Fay, Spofford & Thorndike

Engineers

Charles M Spofford Ralph W. Horne
John Ayer William L. Hyland
Blon A. Bowman Frank L. Lincoln
Carroll A. Farwell Howard J. Williams

Members, American Society of Civil Engineers

Airports, Bridges, Turnpikes
Water Supply, Sewerage and Drainage
Port and Terminal Works
Industrial Buildings

Designs Investigations
Supervision of Construction
BOSTON NEW YORK

Hazen & Sawyer

Engineers

Richard Hazen Alfred W. Sawyer
Water and Sewage Works,
Industrial Waste Disposal,
Drainage
Reports, Design, Supervision of Construction and Operation

110 East 42nd St., New York 17, N. Y.

Hardesty & Hanover

Consulting Engineers

Successors to Waddell & Hardesty

Bridges
Long Spans of All Types
Movable—Lift, Bascule and Swing
Hanover Skew Bascule
Steel and Concrete Spans
Grade Crossing Eliminations

Other Structures
Foundations
Supervision, Reports, Appraisals

101 Park Avenue, New York 17, N. Y.

Frederic R. Harris, Inc.

CONSULTING ENGINEERS

F. H. Dechant, E. J. Quirin, E. H. Harlow

Harbors, Piers & Bulkheads, Drydocks.
Foundations, Soil Mechanics.
Sanitary & Industrial Waste Disposal.
Water Supply, Flood Control.
Airports, Highways, Bridges.
Power, Industrial Plants, Buildings.

27 William Street New York
3 William Street Newark
Fidelity Phila. Trust Bldg. Philadelphia

Howard, Needles, Tammen & Bergendoff

Consulting Engineers
Bridges and Structures

New York, N. Y., 55 Liberty St.
Kansas City, Mo., 1805 Grand Ave.

Knappen-Tippetts-Abbett-McCarthy

Engineers

Ports, Harbors, Flood Control, Power, Dams, Bridges, Tunnels, Highways, Subways, Airports, Traffic, Foundations, Water Supply, Sewerage, Reports, Design, Supervision, Consultation.

62 West 47th Street, New York City

Moran, Proctor Mueser & Rutledge

Consulting Engineers

Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.

New York 17, N. Y. 420 Lexington Ave.

PARDO, PROCTOR, FREEMAN & MUESER
Ap. Corrfos 614 Caracas, Venezuela

Parsons, Brinckerhoff Hall & Macdonald

ENGINEERS

Airports, Bridges, Tunnels, Highways, Traffic and Transportation Reports, Subways, Foundations, Harbor Works, Valuations, Power Developments, Industrial Buildings, Dams, Sewerage, Water Supply.

51 Broadway, New York 6, N .Y.

When you need a SPECIALIST in a hurry . . .

Engineering News-Record's Professional Service Section offers the quickest, most direct method of contacting consultants who may be available NOW.

Malcolm Pirnie Engineers

Civil & Sanitary Engineers

Malcolm Pirnie Ernest W. Whitlock
Robert D. Mitchell Carl A. Arenander
Malcolm Pirnie, Jr.

Investigations, Reports, Plans
Supervision of Construction and Operations.

Appraisals and Rates

25 W. 43rd St., New York 36, N. Y.

The Pitometer Company

Engineers

Water Waste Surveys
Trunk Main Surveys
Water Distribution Studies
Water Measurements & Special Hydraulic Investigations
New York, 50 Church St.

Alexander Potter Associates

Consulting Engineers

Water Works, Sewerage, Industrial Waste, Hydraulic Works, Reports, Designs, Appraisals.

50 Church St., New York, N. Y.

Clyde Potts Assoc.

Weston Gavett-Stanley N. Williams
Consulting Sanitary Engineers

Sewerage and Sewage Disposal
Water Works and Water Supply
Valuations and Appraisals

30 Church Street, New York 7

Preload Engineers Inc.

Founded - 1934

Consultants in Prestressed Design

Designers of more than 800 prestressed concrete bridges, buildings, tanks and high pressure pipe lines erected in North America since 1934.

Carson Dobell *R. H. Thwaits*
Eric Molke *Cedric Steiner*

955 North Monroe Street, Arlington, Va.

Sanderson & Porter

Engineers and Constructors

New York • Chicago • San Francisco

Scheidenhelm, F. W.

Consulting Engineer

Hydraulic Engineering; Hydro-electric Development; Water Supply; Flood Control; Engineering Problems relating to Water Rights and Water Power Law; Appraisals. 50 Church Street, New York 7, N. Y.

Seelye Stevenson Value & Knecht

Consulting Engineers

MANUFACTURING PLANTS
Plans, Specifications, Field Supervision, Reports, Valuation.

HEAVY ENGINEERING
Airports, Paving, Bridges, Stadia, Dams, Water Supply, Sanitation, Tunnels, Piers, Harbors, Industrial Waste Disposal.

STRUCTURAL
Skeleton Buildings, Foundations, Soil Studies, Concrete Control, Underpinning.

MECHANICAL - ELECTRICAL
Steam and Electric Generating Plants, Heating, Air-Conditioning, Refrigeration.

101 Park Ave. New York 17, N. Y.

Severud-Elstad-Krueger

Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Avenue
New York 17, N. Y.

Singstad & Baillie

Consulting Engineers

Ole Singstad David G. Baillie, Jr.

Tunnels, Subways, Highways
Foundations, Parking Garages

24 State St. New York 4, N. Y.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — Additional cards on preceding and following pages

Frederick Snare Corporation

Engineers—Contractors

Harbor Works, Bridges, Power Plants, Dams, Docks and Terminals.
Difficult and Unusual Foundations A Specialty.

233 Broadway, New York City 7

Havana, Cuba — Lima, Peru
Bogota, Colombia, Caracas, Venezuela, San Juan, Puerto Rico, Guayaquil, Ecuador.

D. B. Steinman

Consulting Engineer

BRIDGES

Design, Construction
Strengthening, Investigations, Reports, Advisory Service

117 Liberty St., New York 6, N. Y.

Henry W. Taylor

Consulting Engineer

Water Supply, Sewerage
Refuse Disposal, Incineration
Industrial Developments

151 W. Merrick Rd, Freeport, N.Y.

The J. G. White Engineering Corporation

Design — Construction
Reports — Appraisals

80 Broad Street, New York

Keis & Holroyd

Consulting Engineers

Formerly Solomon & Keis
Since 1906
Water Supply, Sewage Disposal, Garbage & Refuse Incineration, Industrial buildings.

Troy, N. Y. — Ft. Lauderdale, Fla.

Capitol Engineering Corporation

Engineers—Constructors—Management

Bridges — Dams
Planning — Airports
Sewage Systems — Water Works
Design and Surveys — Roads & Streets
Executive Offices Dillsburg, Penna.

Gannett Fleming Corddry & Carpenter, Inc.

ENGINEERS

Dams, Water Works, Sewage, Industrial Wastes & Garbage Disposal, Highways, Bridges & Airports, Traffic & Parking Appraisals, Investigations & Reports.

Harrisburg, Penna.

Branch Offices

Pittsburgh, Pa. — Philadelphia, Pa.
Daytona Beach, Fla., Pleasantville, N. J.

Modjeski and Masters

Consulting Engineers

Design, Supervision, Reports, Inspection and Investigations, of Bridges, Structures, and Foundations.

State Street Bldg. 33rd and Arch Sts.
Harrisburg, Pa. — Philadelphia 4, Pa.

Aero Service Corporation

Photogrammetric Engineers

Aerial Topographic Maps
Precise Photo Mosaics
Plastic Relief Models
236 E. Courtland St.
Philadelphia 20, Pa.

Albright & Friel, Inc.

Consulting Engineers

Water, Sewage and Industrial Wastes Problems, Airfields, Refuse Incinerators, Dams, Power Plants, Flood Control, Industrial Buildings, City Planning, Reports, Appraisals and Rates, Laboratory.
121 So. Broad St., Philadelphia 7, Pa.

Day & Zimmerman, Inc.

Engineers

Designs, Construction, Valuations
Reports and Management
Public Utilities and Industrials

New York — Philadelphia — Chicago

Frederick H. Dechant

Consulting Engineer

Chairman of the Board
Frederic R. Harris Inc.
Water Works, Industrial Wastes, Sewerage, Recovery Processes, Hydraulic Works, Gas Plants.
Philadelphia: Fidelity Phila. Trust Bldg. — New York: 27 William St.

Fridy - Gauker - Truscott & Fridy

Architects & Engineers

Water Sewerage - Industrial Waste Incineration - Power & Distribution Airport - Building - Town Planning
1321 Arch Street - Philadelphia 7, Pa.

G. G. Greulich

Consulting Engineer

Investigations, Reports, Advice, Pile Foundations, Sheet Piling, Cofferdams, Bulkheads, Piers, Bridge Decks, Bank Vaults.
1346 Connecticut NW — 778 Osage Rd.
Washington 6, D. C. — Pittsburgh, Pa.

Hunting, Larsen & Dunnells, *Engineers*

Industrial Plants—Warehouses, Office and Commercial Buildings. Steel and Reinforced Concrete. Design and Supervision. Reports.

1150 Century Bldg., Pittsburgh, Pa.

Morris Knowles Inc.

Engineers

Water Supply and Purification Sewerage and Sewage Disposal, Valuations, Laboratory, City Planning.

Pittsburgh, Pa.

Peter F. Loftus Corporation

Engineering and Architectural Consultants and Designers

First National Bank Bldg.,
Pittsburgh 22, Pennsylvania

Cable Address—
"LOFTUS Pittsburgh"

Gilbert Associates, Inc.

Engineers • Consultants • Constructors

Reading, Pa.

Utilities • Industrials • Municipals
Power • Water • Sewerage
New York • Philadelphia • Washington
Rome • Manila • Medellin

Michael Baker, Jr., Inc.

The BAKER ENGINEERS, Civil Engineers, Planners, and Surveyors. Municipal Engineers, Airport Design, Highway Design, Sewage Disposal systems, Water Works Design and Operation, City Planners, All Surveys. Home Office: Rochester, Pa., Branch Offices: Jackson, Miss., Harrisburg, Pa.

Weigle Engineering Co.

CIVIL ENGINEERS

William E. Weigle — Robert E. Weigle
Donald K. Weigle — Robert A. Meckley
Sewers, Bridges, Airports, Municipal Work
Design and Construction Supervision
Estimates and Flood Control
30 N. Duke St., York, Pa.

SOUTH

Palmer and Baker, Inc.

Consulting Engineers - Architects

Naval Architects - Marine Engineers
Surveys-Reports-Design-Supervision
Consultation
Transportation and Traffic Problems
Tunnels-Bridges-Highways-Airports
Industrial Buildings
Waterfront and Harbor Structures
Graving and Floating Dry Docks
Vessels, Boats and Floating Equipment
Complete Soils, Materials and Chemical Laboratories

Mobile, Ala. — New Orleans, La.
Washington, D .C. — Houston, Texas

Polk, Powell and Hendon

Consulting and Designing Engineers

Municipal and Industrial Works, Investigations and Reports
621 Stallings Building,
Birmingham 3, Alabama

Duval Engineering & Contracting Co.

General Contractors

FOUNDATION BORINGS
For Engineers and Architects.

Jacksonville, — Florida

Rader Engineering Co.

Water Works, Sewers, Refuse Disposal, Ports, Harbors, Flood Control, Bridges, Tunnels, Highways, Airports, Traffic, Foundations, Buildings, Reports, Investigations, Consultations.

111 N.E. 2nd Ave., Miami 32, Florida

Law-Barrow-Agee Laboratories, Inc.

Soils Engineers & Consultants
Soil Testing—Soil Boring—Rock Drilling—Load Testing—Field Control —Engineering Studies—Chemical Analysis—Physical Testing
Box 1558 Atlanta 1, Ga.
Serving the entire South

Patchen & Zimmerman

Engineers

Construction Plant, Cofferdams, Structures, Industrial Plants, Dams, Sewerage and Sewage Treatment, Water Supply and Treatment, Supervision, Surveys, Reports.

Augusta, Ga. — Anniston, Ala.

Eustis Engineering Company

FOUNDATION AND SOIL MECHANICS INVESTIGATIONS

Soil Borings — *Laboratory Tests*
Foundation Analyses — *Reports*

3635 Airline Highway
New Orleans 20, La.

Atlas Engineering Corp.

Industrial Plant Design • Research Laboratories • Nuclear Development Facilities • Housing and Public Works • Investigations • Reports

Knoxville and Oak Ridge Tennessee

MIDDLE WEST

Alvord, Burdick & Howson

CONSULTING ENGINEERS

Water Works — Sewerage
Water Purification — Sewage Treatment
Flood Relief — Power Generation
Drainage — Appraisals

20 North Wacker Drive, Chicago

A. J. Boynton & Co.

ENGINEERS

Fixed and Movable Bridges
Structures
Foundations

Design
Construction

100 N. Wabash Ave., Chicago 2.

Consoer, Townsend & Associates

Water Supply, Sewerage, Flood Control & Drainage, Bridges, Express Highways, Paving, Power Plants, Appraisals, Reports, Traffic Studies, Airports, Gas & Electric Transmission Lines.
351 East Ohio St., Chicago 11, Illinois

Ralph H. Burke, Inc.

CONSULTING ENGINEERS

Complete Architectural and Engineering Services
Plans, Supervision, and Reports

Expressways - Grade Separations
Traffic Studies - Parking Structures
Underground Garages- Shore Protection
Parks-Field Houses-Municipal Works
Airports and Air Terminal Buildings

20 North Wacker Drive, Chicago 6, Ill.

De Leuw, Cather & Company

CONSULTING ENGINEERS

Transportation, Public Transit and Traffic Problems

Industrial Plants — Grade Separations
Railroads — Expressways
Subways — Tunnels
Power Plants — Municipal Works

150 North Wacker Drive
Chicago 6, Ill.

79 McAllister Street
San Francisco 2, Calif.

Greeley and Hansen

Engineers

Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal

220 S. State Street, Chicago 4

Harza Engineering Co.

Consulting Engineers
L. F. Harza
E. Montford Fuelk — Calvin V. Davis
Hydroelectric Plants and Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development
400 West Madison Street — Chicago 6

Hazelet & Erdal

CONSULTING ENGINEERS

Fixed Bridges, Movable Bridges, Industrial Plants, Expressways, Airports, Dams
Monadnock Block, Chicago 4, Ill.
Dixie Terminal Bldg., Cincinnati 2, O.
Commerce Bldg., Louisville 2, Ky.

Pioneer Service & Engineering Co.

Consulting and Design Engineers
Operations - - Purchasing
Steam - - Hydraulic - - Gas
Public Utilities - - Industrials

231 So. La Salle St. — Chicago 4

Sargent & Lundy

ENGINEERS

Steam and Electric Plants
Utilities—Industrials
Studies—Reports—Design
Supervision
Chicago

Wight and Company

Consulting Engineers

Airfields — Municipal Improvements
Sewage Disposal — Pavements — Drainage Surveys

1008 Curtiss St. — Downers Grove, Ill.

Chas. W. Cole & Son

Sewerage, Sewage Treatment, Industrial Wastes, Water Supply, Water Treatment, Airports, Industrial Buildings.
Chas. W. Cole, Sr. — Chas. W. Cole, Jr.
Ralph J. Bushee, — M. J. McErlain

220 W LaSalle, South Bend, Ind.

Consult these Specialists:

Let them save your time by bringing their broad experience in their specialty to bear on your problems.

REMEMBER!!

You can depend on these consultants for a fast, accurate solution to your problems. Consult them when necessary.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — Additional cards on preceding pages

The Hinchman Corporation

Consulting Engineers

CORROSION CONTROL — Surveys, Reports, Design, Specifications, Evaluation

UNDERGROUND UTILITIES—Location, Mapping, leakage surveys, electrical grounding systems

HOLLOW PILING — Directional Surveys by electronics

Francis Palms Bldg. Detroit 1, Mich.

The Austin Company

Design and Construction

Manufacturing and Process Plants
Airports & Air Transport Buildings
Railroad Terminals and Facilities
Power Plants—Industrial & Institutional
Industrial Office Buildings and Laboratories
Reports and Plant Location Surveys

New York CLEVELAND Los Angeles
Chicago Houston Oakland
Detroit Seattle

Havens and Emerson

W. L. Havens C. A. Emerson
A. A. Burger F. C. Tolles F. W. Jones
W. L. Leach H. H. Moseley J. W. Avery
CONSULTING ENGINEERS
Water, Sewerage, Garbage, Industrial Wastes, Valuations—Laboratories
Leader Bldg. Woolworth Bldg.
Cleveland 14 New York 7

Burgess & Niple

Civil and Sanitary Engineers
Consultants since 1908
Water supply, treatment and distribution. Sewage and industrial wastes disposal. Investigations, reports, appraisals, rates. Plant operation, laboratory, plans and specifications.
584 E. Broad St. Columbus 15, Ohio

Edward Jabour

Consulting Electrical Engineer
Design & Layout
Utilities, Oil Refineries,
Process (Chemical & Industrial Plants)
Special Services—To Contractors,
Chemical Plants, Piping Fabricators
1080 Atlantic Toledo, Ohio
Walbridge 5671 Ext. 24

Toledo Testing Laboratory

Engineers—Chemists

Concrete — Soils — Asphalt
Inspection Research
Tests Development
Foundation Investigation
Borings — Diamond Drilling — Load Tests
Soils Mechanics Laboratory

1810 North 12th St. Toledo 2, Ohio

Jones, Henry & Williams

(formerly Jones, Henry & Schoonmaker)
Consulting Sanitary Engineers
Water Works, Sewerage & Treatment
Waste Disposal
Security Building Toledo 4, Ohio

WEST OF MISSISSIPPI

Heron Engineering Co.

Consulting Engineers
For all types of Aerial Tramways, Cableways, and Suspended Structures
2000 South Acoma St.
Denver 19, Colorado

Stanley Engineering Company, *Consulting Engineers*

Airports - Drainage - Electric Power Flood Control - Industrial - Rate Studies - Sewerage - Valuations - Water Works
Hershey Building Muscatine, Ia.

Black & Veatch

Consulting Engineers

Water - Sewage - Electricity - Industry
Reports, Design, Supervision of Construction, Investigations, Valuation and Rates.

4706 Broadway, Kansas City 2, Mo.

Burns & McDonnell

Consulting and Designing Engineers

P. O. Box 7088, Kansas City 2, Mo.

1404 E. 9th St., Cleveland 14, Ohio

Harrington & Cortelyou

Consulting Engineers
Frank M. Cortelyou
E. M. Newman F. M. Cortelyou, Jr.
Movable and Fixed Bridges of All Types, Foundations, and Related Structures.
1004 Baltimore Kansas City 6, Mo.

Russell and Axon

Consulting Engineers
Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations
408 Olive St. St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

CHECK this Section whenever you need professional advice.

Sverdrup & Parcel, Inc.

Consulting Engineers
Bridges, Structures and Reports, Industrial and Power Plant Engineering.
Syndicate Trust Bldg., St. Louis 1, Mo.
220 Bush St., San Francisco 4, Calif.

William J. Wenzel

Consulting Engineer

Great Falls, Montana

Developing the Great Northwest

Benham Engineering Co.

Established in 1909
Design and Construction Engineering Services for Water and Sewage—Highways and Structures—Airports—Power and Heating Plants
Suite 550 American National Building
Oklahoma City, Oklahoma

Lockwood & Andrews

Consulting Engineers
Airports, Paving, Industrial Plants, Drainage & Sewerage, Site Locations, Soils & Foundations, Water Supply, Structures, Harbor Works, Valuations, Reports — Design — Supervision
Union Nat'l Bank Bldg., Houston, Tex.

FAR WEST

John S. Cotton

Consulting Engineer
Hydroelectric, water supply, irrigation, and multiple purpose projects; flood and erosion control; river basin development planning; dams and their foundations; tunnels; marine structures; valuations; rates.
28 Brookside Dr., San Anselmo, Calif.

D. B. Gumensky

Civil and Structural Engineer
Hydroelectric Power, Water Supply
Dams, Tunnels, Unusual Structures
All Types Structural Design
Complete Development of Projects
1047 Sierra, Berkeley, Calif.

International Engineering Company, Inc.

ENGINEERS
Investigations - Reports - Design
Procurement - Field Engineering
Domestic and Foreign
74 New Montgomery St.
San Francisco 5, California.

FOREIGN

Atlantic, Gulf and Pacific Company of Manila

Engineers
Design - Construction
Inquiries invited for work in the Philippines and Far East.
P. O. Box 626, Manila, Philippines
Cable Address: DREDGING Manila

Hutchings & Milani, Ltd.

Engineers & Constructors
Industrial - Roads - Power Plants
Dams - Tunnels - Harbor Works
Foundations - Hotels
CARIBBEAN - WEST INDIES
SOUTH AMERICA
BERMUDA-CARIBBEAN
CONSULTANTS, LTD.
Architects & Engineers.
Design - Reports - Investigations
L. C. Milani, ASCE; C. W. Abbott, R.I.B.A.; N. J., Senesey, A.I.A.; P. Collier; T. F. Carr, B. J. Williams; S. H. Pace; W. Weir.
BOTH HEAD OFFICES AT HAMILTON, BERMUDA.

The Foundation Engineering Company of Puerto Rico

Consulting Engineers
Foundation and Soil Mechanics Investigations, Laboratory analyses, reports and recommendations, design of structures, Supervision.
P. O. Box 821, San Juan, Puerto Rico

INSPECTION & TEST

Robert W. Hunt Company

Inspection and Tests of Engineering Materials and Equipment.
General Offices and Laboratories
175 West Jackson Blvd., Chicago 4
All Principal Cities

Johnson Soils Engineering Laboratory

Engineering design and construction tests run from MOBILE LABORATORY UNITS at construction site.
Field load bearing tests.
193 West Shore Ave., Bogota, N. J.
Bogota-Hubbard 7-4408

The Haller Testing Laboratories, Inc.

Testing and Inspection of Construction Materials
Complete Soils Laboratory
Load Tests—Soils & Structures
Concrete and Bituminous Materials

801 2nd Ave., New York 17, N. Y.
Plainfield, N. J. New Haven, Conn.
Boston, Mass.

MARINE DIVING

Walter Detrick

Marine Diver
Construction • Repair • Salvage
Quincy, Illinois
9006 Phones 758

SEARCHLIGHT SECTION

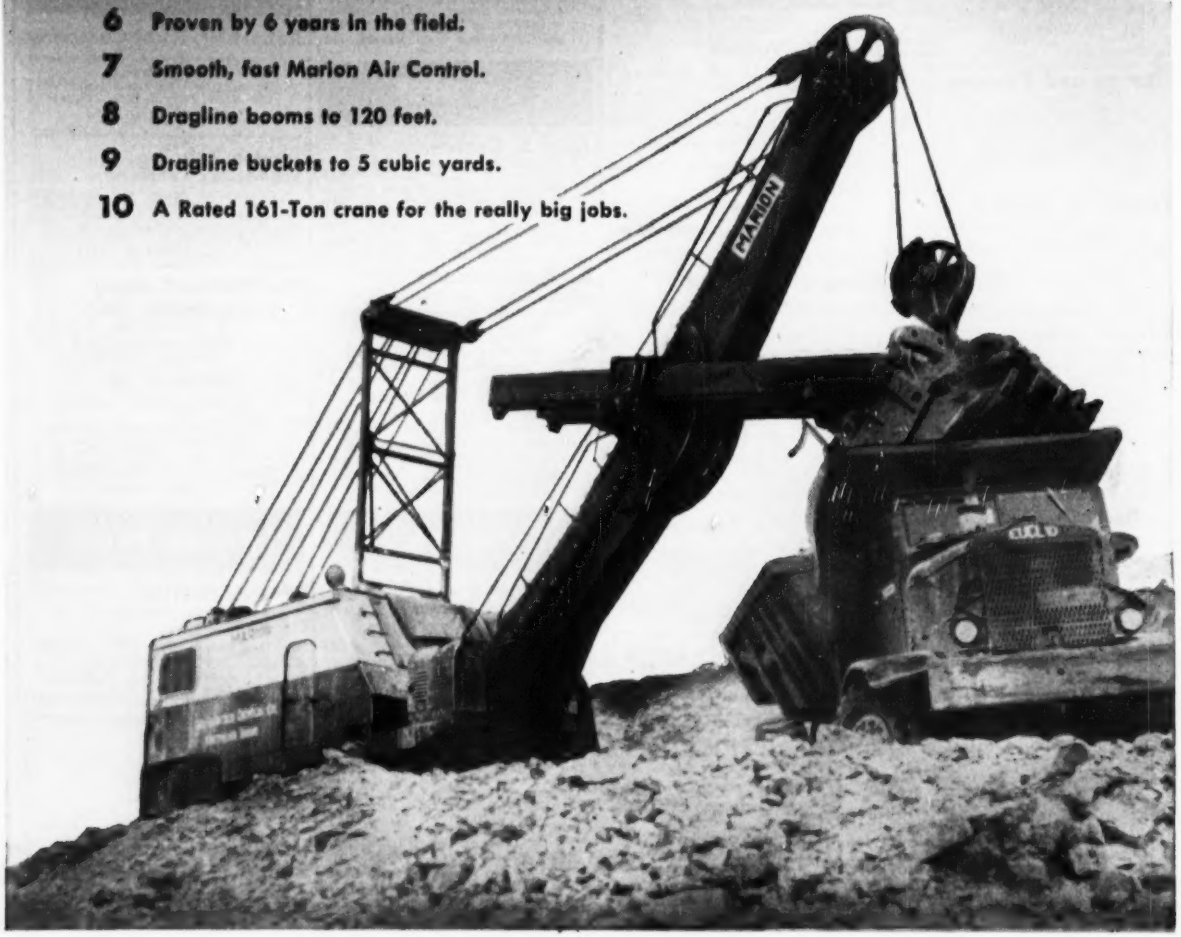
This index is published as a convenience to the reader. Every care is taken to make it accurate but SEARCHLIGHT SECTION assumes no responsibility for errors or omissions.

Albert Pipe Supply Co., Inc. 70
Ambursen Dam Co., Inc. 72
American Air Compressor Corp. 71
Amerlux Steel Products Corp. 72
Baltimore Contractors Inc. 70
Bernstein Bros. 72
Clarke-Aiken Co. 70
Clemens Construction Co. 71
Concrete Equipment Co. 72
Congress Bldg. Inc. 68
Conkey Construction Co., Hunkin H. 71
Contractors Machinery Co. 72
Contractors Trading & Equipment Corp. 70
Cuyahoga Wrecking Co. 71
Dalton Supply 68
Darien Corp. 72
Davidson Pipe Co., Inc. 70
Deatherage & Son, George E. 68
Dick Construction Co. 71
Drachman Steel Co., Inc., H. Y. 70
Everist, Inc., L. G. 68
Foster Equipment Co., L. B. 72
Framingham Sand & Gravel Co., Inc. 69
Frank, M. K. 70
Frownie Construction Corp. 68
Gannett, Fleming, Corddry & Carpenter Inc. 67
Gillis & Co. 70
Globe Pipe & Fitting Co. 70
Gold Coast Office 67
Harza Engineering Co. 67
Hughes Bros. Inc. 71
Hunter Tractor & Machinery Co. 70
Maryland Steel Products Co., The 67
Maselli Corp., N. D. 70
McDonald, J. C. 72
Midwest Steel Corp. 70
Mississippi Valley Equipment Co. 72
Orban Co., Inc., Kurt 72
Parker Safety Equipment Co. 68
Queensboro Steel Corp. 70
Read Corp., Howard W. 72
Skyline Distributors Inc. 68
Smith Co., H. Y. 68
Stanhope Inc., R. C. 72
Tagco Inc. 70
Tennessee Valley Authority 67
Tractor & Equipment Co. 70
Vilbro Equipment Co., Inc. 68
Williams Construction Co. 71
Wilson Engineering Corp. 68

BASIC FEATURES
That Really Count!

Get them in the
MARION 111-M

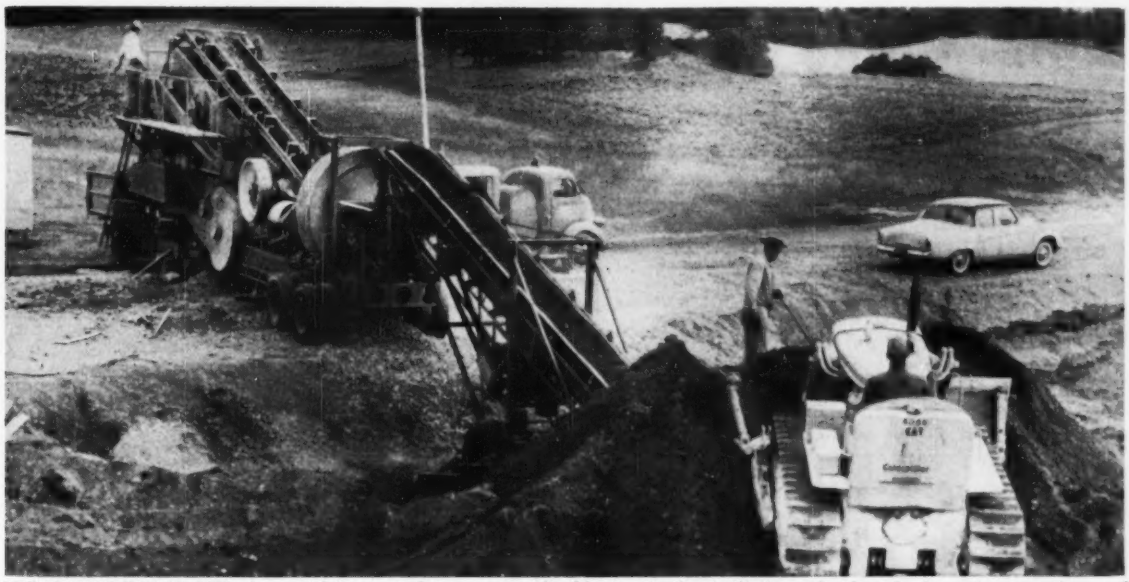
1. Four cubic yard dipper capacity.
2. Electric swing on a diesel machine.
3. All-electric if desired.
4. Ships on two rail cars.
5. Ideal companion equipment of big haulage units.
6. Proven by 6 years in the field.
7. Smooth, fast Marion Air Control.
8. Dragline booms to 120 feet.
9. Dragline buckets to 5 cubic yards.
10. A Rated 161-Ton crane for the really big jobs.



MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from ¾ cu. yd. to 45 cu. yds.



STRAIGHTLINE FLOW of material is reported to save considerable time in that it eliminates bottlenecks, bypassing operations and double scalping. Plant conveyor belts are 30 in. wide to match the high productivity of the rest of the plant.

New portable crushing plant boasts high production rate

The All American 77 is a high capacity crushing and screening plant that is completely mobile for highway transportation. Recent field tests are reported to show it capable of producing more than 350 tons per hour of ¾-in. or smaller aggregate.

Much of this high productivity is attributed to the straight line operation of the plant, but helping also is the oversized star gear roll crusher. This 36x22-in. unit is designed to crush 2½-in. material to ¾-in. aggregate and thereby relieve the 10x36-in. jaw crusher of preparing material to 1¾ in. for crushing in a smaller set of rolls. Similarly, a 4x12-ft, 2½-deck vibrating screen allows considerable screening area and is said to provide better segregation of aggregates. To speed transfer of materials within the plant, all conveyors employ 30-in. wide conveyor belts. Rotor lift is two feet wide and has a 7-foot diameter.

Another feature of the plant is the hydraulic mechanism for raising and lowering the vibrating screen to and from travel position. Operation of a hand control on the operator's platform saves considerable time and effort in setting up and dismantling.

A side-mounted power unit drives the plant through a spline shaft—power is distributed by guarded V-belt drives wherever possible. Control of the unit is maintained from an operator's platform mounted to afford a full view of the plant.

The entire plant is mounted on an electrically welded goose-necked trailer provided with a fifth wheel plate and pin on the front and two axles and equalizer on the rear. A folding delivery conveyor allows room for the tractor cab while traveling.

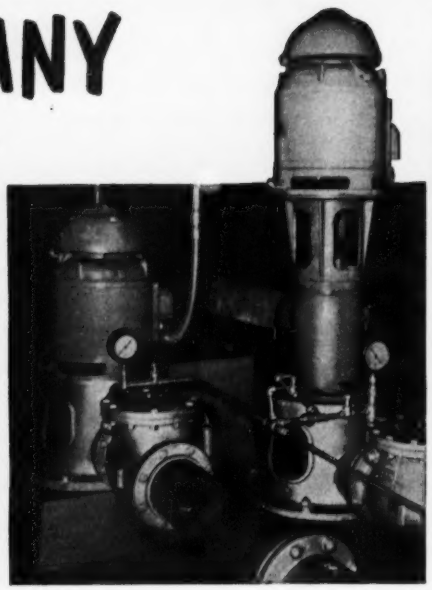
Road weight of the unit is 64,000 lb —within most legal weight limits.

As optional equipment, the plant can be furnished with either single or double axle front dolly, sand rejector, chip eliminator and mechanical, air or vacuum brakes on the four rear wheels. DIAMOND IRON WORKS, INC., 1748 N. SECOND ST., MINNEAPOLIS 11, MINN.

(*New Products continued on page* 78)

OPERATOR'S PLATFORM, the control center for the crushing and screening operations, is mounted to afford a full view of the entire plant. It is from there that the vibrating screen may be raised or lowered hydraulically to and from travel position.

ready for ANY emergency



Construction of Deming Vertical Turbine Pumps permits almost unlimited combinations of standard components to meet specific requirements. In the example illustrated, two Deming Turbine Pumps are ready for any emergency. Depending upon requirements, these units can be operated separately, or as a team to meet peak load demands. Pump shown at right is direct-connected to a steam turbine for instant action in case of electric power failure. Write for illustrated BULLETIN No. 4700.

DEMING Pumps

THE DEMING COMPANY, 536 BROADWAY, SALEM, OHIO

HOW TO SELECT A CLAMSHELL BUCKET

For best performance be sure to check

- Crane Capacity
- Work To Be Done
- Clearances
- Bucket Type and Size

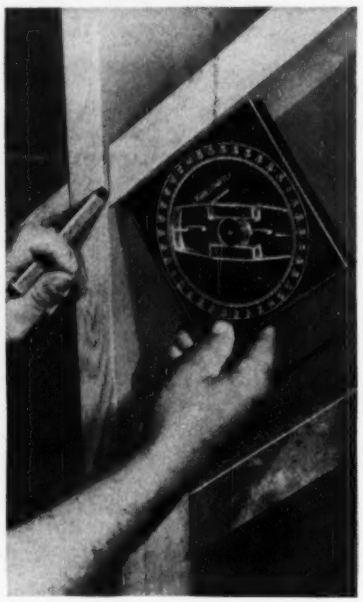
Determine the *closing line pull*; also *size* of closing and holding cables. The *allowable gross load* is the closing line pull or the safe working gross load . . . *whichever is less.* •Consider *headroom clearance* and any other *space limitations* • Determine the *character of the material* to be handled or excavated • Then select the *type, size* and *weight* of bucket, and the proper *accessories* to make the bucket adaptable to your operations.

Blaw-Knox can best give you the engineering service that makes possible proper selection of the bucket suited for your needs.

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
2001 Farmers Bank Building • Pittsburgh 22, Pa.

BLAW-KNOX CLAMSHELL BUCKETS
The Most Complete Range of Sizes and Types

NEW PRODUCTS



Combination instrument figures the angles

A new combination tool can be of aid in figuring and laying out roof framing, leveling floors and foundations and for rough surveying of banks, ditches, etc.

The instrument is 6 in. square and ¾ in. thick. A circle on the front face is graduated in degrees and is used in conjunction with a rotating indicator.

In leveling, the instrument is placed on edge on a beam running between two supports. The indicator is rotated until one of the level bubbles built into the indicator shows that the plane of the indicator is horizontal. After this the angle of the beam may be read from the graduated circle and with this information plus the distance between supports, the difference in support levels (in inches) may be read from a table on the reverse side of the instrument.

Roof framing is simplified by setting the angle of roof pitch on the instrument and positioning the rafter by leveling the indicator bubble.

The device may be used also as an adjustable square. The desired angle is set with the indicator and circle; projecting tabs on the indicator are then placed so that they ride on the edge of the lumber to be cut.

On a large scale, the instrument may be mounted on a long grading board or hung on a chalk line to determine the slopes of banks, ditches, etc.

The Krollometer, as it is called, carries on the reverse side a scale

LOOK JOE! SAW SMOOTH — STRAIGHT OPENINGS

for PATCHES & TRENCHES with a . . . Clipper CONSAW

SAVE TIME — MATERIAL — MONEY by "SAWING BEFORE BREAKING" with a . . .®

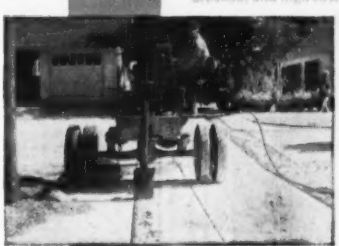
MODEL C-130 ONE OF 5 MODELS, GAS OR ELECTRIC POWERED

Save up to 50% in labor and material. Saw repair patches — water, gas, sewer and air line trenches in floors, streets, walks and highways. Save too, by sawing contraction joints in floors and highways . . . eliminate costly hand forming and spalling.

"4 OUT OF 5" BUY CLIPPER CONCRETE SAWS. Three-Point Suspension (see below) . . . the Patented Water Application which increases blade life and speed . . . perfect balance and dashboard controls for operating ease and maneuverability — these are the reasons WHY — "4 OUT OF 5" Buy Clipper!

Joe! Stop excessive breakout and high cost

Only minimum replacement material needed and is poured to straight, smooth edges.



Sawed lines confine breakout fracturing and speeds removal up to 50%

Joe! Stop radial fracturing and excessive costs

Contraction joints in floors or streets eliminates spalling, 50% less seal and are maintenance-free.

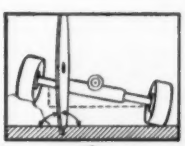
Joe! End slow, costly hand forming, spalling

NEARLY 20 YEARS EXPERIENCE
Sawing Concrete of All Types

The unqualified Clipper guarantee of satisfaction is backed by world-wide experience, the ability to select the finest materials and the "know-how" to put them together.

YOU CAN DEPEND ON CLIPPER SUPERIOR DIAMOND BLADES

. . . guaranteed to . . . "Provide the fastest cut . . . at the lowest cost." Clipper alone can supply every necessary metal bond . . . in over 36 specifications.



THREE POINT "No-Bind" SUSPENSION

Three Point Suspension holds the blade straight and true in the cut — **eliminates** binding — drifting — sidewear and friction. Guarantees the **longest possible** blade life!

CLIPPER MASONRY SAW

. . . the ONLY saw in the world that will cut masonry materials of every size and description. Clipper outperforms them all for ONLY Clipper is "CONVERTIBLE" and has the Patented Features for **flexibility.** A Clipper Model to fit any job — any budget. Sold on FREE TRIAL . . . Priced from $265.

MODEL HD 15 MODELS PRICED FROM $265

FREE TRIAL!

ORDER TODAY . . . on FREE TRIAL. Discover for yourself how Clipper will increase your profits by increasing your production at reduced costs. Clipper "ON THE JOB" FREE TRIAL guarantees satisfaction at *no obligation.*

THERE'S A CLIPPER FACTORY BRANCH NEAR YOU

Clipper

KANSAS CITY 8, MISSOURI

MR. CLIPPER

SAME DAY SERVICE FROM YOUR NEAREST FACTORY BRANCH —

COAST TO COAST

- PHILADELPHIA
- ST. LOUIS
- CLEVELAND
- DETROIT
- AUSTIN, TEX.
- CHICAGO
- LOS ANGELES
- BOSTON
- HOUSTON
- MILWAUKEE
- ST. PAUL
- INDIANAPOLIS
- NEW YORK
- PITTSBURGH
- DENVER
- SAN FRANCISCO
- CINCINNATI
- ATLANTA
- WASHINGTON, D.C.
- BIRMINGHAM
- CHARLOTTE, N.C.
- DALLAS
- KANSAS CITY

IN CANADA — P.O. BOX 476, WINDSOR, ONTARIO

MAIL COUPON NOW

SOLD ONLY DIRECT FROM FACTORY BRANCHES

CLIPPER MANUFACTURING CO.

2812 W.N. WARWICK • KANSAS CITY 8, MO.

Send FREE Literature and Prices on:

☐ CLIPPER CONSAWS ☐ CONSAW DEMONSTRATION

☐ CLIPPER MASONRY SAWS ☐ CLIPPER DIAMOND BLADES

No. 13-C

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

IF IT'S A

PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

FOR THAT DE LUXE GAL

BUCKSKIN HANDBAG

$29.75 Prepaid

A distinctive gift more eloquent than words. Leather lined, pocket and strap. Hand made in smooth-tan, eggshell or brown suede. Matching gloves $5.50.

GIFT BOXED—FAST SERVICE

KIRBY SALES CO.

EAST CHATHAM, NEW YORK

DRILLING CONTRACTORS

Diamond and Shot Core Borings
Dry Sample Borings
Grout Holes and Pressure Grouting
Foundation Testing for Bridges, Dams and other Heavy Structures

Manufacturers, also, of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits. Ask for Bulletin 320.

SPRAGUE & HENWOOD, Inc.

Dept. E, Scranton 2, Penna.

graduated into quarter inches, a scale that translates degrees to inch per foot drop and another scale that translates degrees to percentage of grade. CHRISTENSEN & KROLL, P.O. Box 284, McMINNVILLE, ORE.

Weight is reduced on load transfer assembly

A new load transfer assembly weighs only 4½ lb per lineal foot or 54½ lb in 12½ ft lengths—a little more than half the weight of units at present employed. It is easily handled, placed and staked by one man yet is designed to carry heavier loads than standard road and airbase dowel and load transfer assemblies.

On the unit the rod frame acts as a working member, helping to distribute the traffic load through the entire end of the concrete slab in which the assembly is used. Stress reducing coils are an integral part that helps prevent crushing of the concrete at the critical face of the joint.

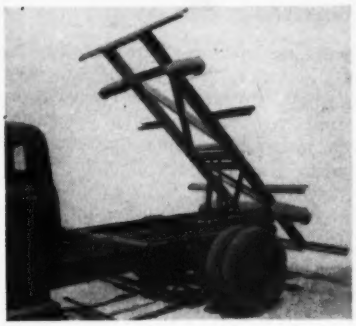
Although the Richmond dowel is only 6 in. long versus conventional 18-in. dowels, laboratory tests are reported to show that the new unit is stronger—deflection is one-third less than standard under a 10,000-lb load.

LIGHT weight permits one-man handling.

The new assemblies are now installed at Idlewild Airport in New York and are soon to be used in a highway project. All factors considered, cost is competitive with ordinary road joints, and the assemblies may be used for either contraction or expansion joints. RICHMOND SCREW ANCHOR CO., INC., 816 LIBERTY AVE., BROOKLYN 8, N. Y.

(*New Products continued on page 81*)

STRICTLY A ONE-MAN OPERATION, the Traveloader slips into 12-ft wide spaces to pick up and deliver its 15-ton load. The combination fork lift and load carrier has been designed to self-load lumber and steel stock and carry them at speeds up to 30 mph. Pneumatically-tired dual wheels, both front and rear, are said to provide equalized, four-point load distribution on travel surfaces while stability is assured since loads are carried inboard on the load deck; loading stability is aided by hydraulic outriggers. Maximum lift height of the power-steered unit is 12 ft. Baker-Raulang Co., Baker Industrial Truck Div., 1230 W. 80th St., Cleveland 2, Ohio.



Three-way dumping hoist eliminates truck jockeying

A simple alternative arrangement of pivot hinges combined with a Norweld hydraulic hoist can convert almost any 1½ or 2-ton truck into a dump truck that will unload to the right, left or from the rear.

The three-way hoist comes in a self-contained unit that includes structural steel stringers and underbed reinforcing. The complete unit is bolted to the bed and truck frame. Changing the dump position is accomplished in thirty seconds by altering the position of the anchoring pivot pins. The bed can also be locked for rough hauling of shifting loads.

The unit also includes a ball bearing mounted gear pump and cab controls. NORWELD, INC., LOVELAND, COLO.

Tape forms calking handles more easily

PRC No. 620 is a new calking compound supplied in tape form for easier, faster handling. The soft, moldable material is supplied with a thread core to give it body and prevent stringing out or sagging when unrolled.

The material is said to maintain its original consistency indefinitely without drying out, cracking or shrinking, and to resist such changes in temperatures from 25 below zero to 250 deg F. It is said, too, that the compound can be subjected to intermittent 450-deg F. temperatures without damage.

The tape has a tacky, adhesive back so that it may be thumbed into cracks and crevices, but it can be painted over immediately after application.

PRC 620 tapes are available in a variety of widths and in ⅛, ¼ and ½-in. thicknesses—¼in. oval beads are also obtainable. PRODUCTS RESEARCH CO., 3126 LOS FELIZ BLVD., LOS ANGELES 39, CALIF.

Old Sewer Gets New Life with "GUNITE"

The picture at the left shows an old concrete storm sewer in Washington, D. C., badly disintegrated and honeycombed. Flow value was low due to roughness. This sewer was reconditioned by chipping away the worst areas, sandblasting the entire surface and applying a "GUNITE" lining.

The smooth brush finish increased its capacity sufficiently to meet all requirements, making it unnecessary to build a new sewer. The completed job is shown at the right.

Many money saving applications of "GUNITE" are described in our illustrated Bulletin A2400. Request on your letterhead will bring you a copy.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.
MANUFACTURERS OF THE CEMENT GUN

PHOENIX BRIDGE COMPANY
Engineers—Fabricators
Erectors
Structural Steel
BRIDGES and BUILDINGS
General Office and Shops
PHOENIXVILLE, PA.
Subsidiary—Barium Steel Corporation

HOT DIP GALVANIZING
YOU can profit by our experience of over 50 years in Hot Dip Galvanizing. Our equipment is modern, our men are skilled and our deliveries and prices are right.
We have galvanized thousands of tons of: gratings, beams, bars, perforated screens, sections, forms, tanks, fittings, rails, fastenings, etc. *Excellent facilities for pickling and oiling.*
ENTERPRISE GALVANIZING CO.
2517 E. CUMBERLAND ST. • PHILADELPHIA 25, PA.

WOOD RESISTS FIRE
if it is Pressure-Impregnated CZC (FR)® Wood
Send for Booklet G28 which tells how structures can be built with wood for protection against fire hazards—to offer greater safety to contents and people.
KOPPERS
KOPPERS COMPANY INC.
Wood Preserving Division
Pittsburgh 19, Pa.

Timber Bridge Carries 100 Ton Load...

Bridge of J. Neils Lumber Co., Libby, Montana, consists of 155-foot center span and two side spans of 152 feet plus approaches. Truss members and floor beams are glued laminated timbers, fabricated to engineering detail, creosoted and assembled in place. Decking is longitudinally laminated planking. All metal hardware is galvanized.

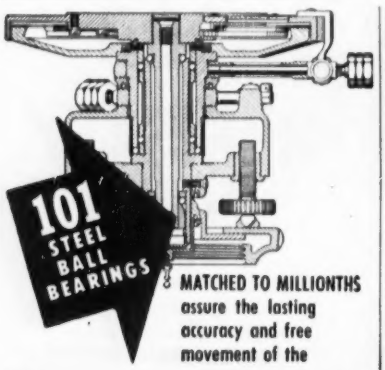
This bridge, which required only six months for engineering, fabrication and erection, is designed to carry 100-ton loads of logs and equipment and to last for 75 years. It is typical of the ability of Timber Structures, Inc. to provide engineered structures at moderate cost and for long, hard service. It points the way to significent savings and minimum maintenance for private and publicly owned bridges.

Timber bridges are available in several types to fit varying conditions of service and site location. For detailed information, ask your nearest Timber Structures representative for the new booklet, "Timber Bridges", or write us direct.

TIMBER STRUCTURES, INC.

P. O. BOX 3782-C, PORTLAND 8, OREGON

Offices in Ramsey, N. J.; Chicago; Detroit; Kansas City; St. Louis; Minneapolis; Columbus; Milwaukee; Omaha; Des Moines; Wichita; Dallas; New Orleans; Birmingham; Charlotte; Louisville; Memphis; West Hartford; Seattle; Spokane; Eugene; Richmond, California; Peterborough, Ontario; New Westminster, B. C.



MATCHED TO MILLIONTHS assure the lasting accuracy and free movement of the

BRUNSON BALL-BEARING BASE*

USED ON ALL BRUNSON SURVEYING INSTRUMENTS

Permanently lubricated and factory sealed against dust, the Brunson Ball-Bearing Base allows a total eccentricity of not more than + or − ¼ second of angular error. To obtain this accuracy, it is necessary for us to engineer and produce in our own plant these Bearings and spindles—each stabilized to the accuracy of precision gauge blocks. Because these ball bearings are pre-loaded and operate under tension, they remove all grease from the point of contact. This assures greater accuracy than any other type of bearing which must allow for grease or oil film. *Write for details.* *Patented.

LASTING BRUNSON ACCURACY

BRUNSON INSTRUMENT COMPANY, INC.

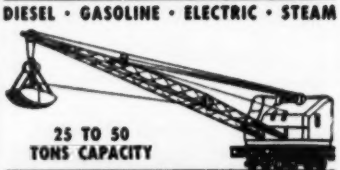
1405 Walnut St. • Kansas City 6, Mo.

DEPENDABLE

OHIO

LOCOMOTIVE CRANES

DIESEL • GASOLINE • ELECTRIC • STEAM



25 TO 50 TONS CAPACITY

THE OHIO LOCOMOTIVE CRANE CO.

BUCYRUS, OHIO

GUNITE

Since 1915

CONCRETE

SAND AND CEMENT Placed by Air

38 YEARS OF EXPERIENCE PLUS—

Hundreds of nationally known clients is evidence of our engineering and construction ability to produce "Gunite" concrete construction at a lower overall cost.

Send for specifications and bulletins—no obligation.

See our catalog in Sweets

GUNITE CONCRETE & CONST. CO.

ENGINEERS — CONTRACTORS

1301 WOODSWETHER RD., KANSAS CITY, MO

CHICAGO — ST. LOUIS — MINNEAPOLIS

DENVER — HOUSTON — NEW ORLEANS

PUBLICATIONS

Pneumatic ejector—A 4-page folder describes what is called the simplest pump ever invented. The Pneu-Pump is said to operate at high efficiency even with low volumes that tend to decrease the efficiency of many other types of equipment. The ejector is reportedly capable of handling any fluid that will flow into it, including abrasive liquids, acids, alkalis, brine, mud, slurries, tar and sludges. The folder shows typical installations and cross-sectional views of the pump itself. Write for Bulletin 4600, YEOMANS BROS. CO., 1999 NO. RUBY ST., MELROSE PARK, ILL.

Filter bed distributors—A new 20-page bulletin describes Dorrco distributor type, size and capacities, operating and mechanical features and applications to both high and low rate trickling filter treatment. Also included are photographs of actual installations as well as cutaways and wash drawings illustrating mechanical details. The self-propelled machine is available in sizes ranging from 20 to 200 ft in diameter and capable of handling 60 to 22,000 gpm. The distinguishing mechanical features of the unit include a quick opening dump gate at the end of each arm to permit easy flushing, adjustable orifice slots to allow final flow regulation and minimize clogging and a positive air seal to protect the mercury seal between the rotating and fixed elements from physical contact with sewage. Bulletin No. 6300, THE DORRCO DISTRIBUTOR. THE DORR CO., BARRY PL., STAMFORD, CONN.

Hand hoists—Yale Load King hand hoists, with capacities from ½ to 2 tons, are described and illustrated in Bulletin P-1254A. Illustrated are design features such as the load brake, steel safety load hook, steel load sheave, non-fouling hand chain guide and one-piece hand wheel. The 8-page booklet also points out the hoist's advantages of unusually light weight and up to 95% efficiency for faster and easier lifting.—THE YALE & TOWNE MFG. CO., ROOSEVELT BLVD. & HALDEMAN ST., PHILADELPHIA 15, PA.

Hydraulic truck gate—A new bulletin pictures the improved Heiloader elevating truck tailgate in various stages of operation. A large, detailed photograph illustrates the safety features of the new tailgate. Complete specifications for all types of installations are given. Bulletin BH-53105.—THE HEIL CO., 3000 W. MONTANA ST., MILWAUKEE 1, WIS.

ADVERTISERS IN THIS ISSUE

Barber-Greene Co. 59
Bethlehem Steel Co. 1
Blaw-Knox Equipment Div., Blaw-Knox Co. 78
Blaw-Knox Co. 54
Borden Metal Products 20
Borden & Riley Co. 56
Broderick & Bascom Rope Co. ..... 4th Cover
Brunson Instrument Co. 82

Cement Gun Co. 81
Chapman Valve & Mfg. Co 10
Clipper Mfg. Co. 79
Complete Machinery & Equipment Co. 57
Crucible Steel Co. 9

Deming Co., The 78

Ellicott Machine Corp. 13
Enterprise Galvanizing Co. 81

Faber-Castell Pencil Co., A. W. 46
Ferguson Co., H. K. 44
FlexibleRoad Joint Machine Co. 8

General Electric Company, Bridgeport Div. ..... 2nd Cover
Goodrich Co., The B. F. 5
Griffin Wellpoint Corp 80
Grinnell Co., Inc. 3
Gulf Refining Co. 7
Gunite Concrete & Const. Co. 82

Hayward Co. 58
Huffman-Wolfe Co., The 50

Ingalls Iron Works Co. 14
Intrusion-Prepakt, Inc. 34

Johns-Manville Corp. 6

Kern Instrument Co. 56
Kirby Sales Co 80
Koppers Co., Wood Preserving Div. 81

Lincoln Electric Corp. 27
Link Belt Speeder Corp. 18

Macomber, Inc. 38
Marion Power Shovel Co. 76
McKiernan-Terry Corp. 57
McKinney Drilling Co. 58
Monsanto Chemical Co. 11
Mueller Co. 4

National City Bank of N. Y. Insert. 33
Nelson Stud Welding Div., Gregory Industries, Inc. 45

Ohio Locomotive Crane Co. 82

Permutit Co., The 51
Phoenix Bridge Co. 81
Plasteel Products Co. 30

Raymond Concrete Pile Co. ..... 3rd Cover
Rogers Bros. Corp. 15

Servicised Products Co. 83
Shawnee Mfg. Co., Inc. 50
Simplex Valve & Meter Co. 54
Smith Engineering Works 16
Socony Vacuum Oil Co. 12
Sprague & Henwood, Inc. 80
Superior Concrete Accessories 40

Timber Structures, Inc. 82
Trailer Village, Inc. 58
Twin Disc Clutch Co. 47

Union Metal Mfg. Co. 52
U. S. Rubber Co. 29
Universal Sewer Pipe Corp. 43

Vibro-Plus Products, Inc. 59

Wild Surveying Instrument Supply Co of Amer., Inc., Henry 2

Professional Services 73, 74, 75

SEARCHLIGHT SECTION

(Classified Advertising)
H. E. Hilty, Mgr.

Employment 67, 68
Educational 68
Business Opportunities 68
Notices 64-65, 66
Equipment (For Rent, Sale, Wanted) 68-72

ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000
D. S. Robertson, Advertising Sales Mgr.
Howard T. Olsen, *Business Manager*

ADVERTISING REPRESENTATIVES:

New York, 36—330 W. 42 St.,
M. J. Storz, E. A. Callahan, Jr.

Chicago, 11—520 No. Michigan Ave.,
F. G. Hudson, L. H. Hunt, W. G. Payne

San Francisco, 4—68 Post St.,
R. E. Dorlund

Philadelphia, 3—17th and Sansom Sts.,
A. B. Cozzens

Cleveland, 15—Hanna Bldg.,
E. E. Duff, Jr.

Detroit, 26—Penobscot Bldg.,
B. F. Horn

St. Louis, 8—Continental Bldg.,
W. E. Donnell

Los Angeles, 17—1111 Wilshire Blvd.,
H. L. Keeler

Atlanta, 3—Rhodes-Haverty Bldg.,
R. H. Sidur

Dallas, 1—First National Bank Bldg.,
J. H. Cash

OTHER SALES OFFICES:

Pittsburgh, 22—738-39 Oliver Bldg.
Boston, 16—350 Park Square Bldg.
London, McGraw-Hill House

Servicised Cementone Sponge
RUBBER JOINT FILLER

- Matches Color of Concrete
- Fully Resilient . . . Non Extruding
- Made in Any Degree of Compressibility
- Supplied in Any Thickness, Length

Servicised Cementone Gray Sponge Rubber Expansion Joint meets the need for an inconspicuous joint filler for architectural concrete. Can be supplied in any degree of compressibility to meet your requirements.

Write for details and the complete Servicised Catalog today. There is no obligation. See SWEET'S Catalog.

SERVICISED PRODUCTS CORP.
6051 W. 65TH ST. • CHICAGO 38, ILL.

memo:

McGRAW-HILL
TECHNICAL WRITING SERVICE

WRITES • EDITS
ILLUSTRATES
PRINTS

YOUR publications . . .
to YOUR specifications

TWS relieves you of all or any of the many problems encountered in the production of your . . .

EQUIPMENT MANUALS - HANDBOOKS
PRODUCT CATALOGS-TRAINING AIDS
PAMPHLETS — REPORTS — BROCHURES
COMPANY HISTORIES — PARTS LISTS

150

WRITERS — EDITORS — ARTISTS
ARE AT YOUR SERVICE

WRITE:
Project Consultant
TWS—McGraw-Hill
330 W. 42 St. NYC 36
Phone: LOngacre 4-3000

EDITORIALS

Competent inspection is the lesson

THE CAUSE OF THE COLLAPSE last July of a four-story "flat-plate" office building in Scarsdale, N. Y., while concrete was being placed for the fourth floor, may never be known with certainty. Testimony submitted to the Westchester County grand jury cannot be revealed. Furthermore, the various consultants engaged to investigate the collapse are constrained not to discuss their findings. Engineers who had hoped to learn from this mishap have a right to be disappointed by this state of affairs.

This is particularly galling since the grand jury's presentment stated that "there existed in said structure at the time of the collapse certain defects in design, material and construction which may have caused or contributed to the collapse" (ENR Nov. 19, p. 26). With this statement as background, and the additional grand jury opinion that "they (the defects) could have been averted by more adequate over-all engineering or professional supervision and inspection," it is evident that conjecture as to what triggered the failure can cover a wide range.

Conjecture without more knowledge would, however, be useless. A better way to gain a valuable lesson is merely to take the Scarsdale case as a warning, and to consider flat-plate type of design and construction in general. What, for example, can be done wrong on buildings of this type that might threaten their safety?

The first thing to be noted is that there are certain well-known critical requirements that must be fully met if this relatively new type of reinforced concrete construction is to function satisfactorily. These requirements include: provision of foundations not subject to relative movement; adequate reinforcement of the floor and roof slabs, particularly that it be properly positioned and of correct length for bending moment, shear and diagonal tension; columns capable of resisting possible bending moments as well as direct loads; concrete of specified strength; and adequate shoring of forms and re-shoring of floors that support the load of shores from higher levels. Failure to satisfy any one of these requirements can lead to failure of the structure.

In the circumstances of a type of construction so sensitive to design or construction errors, adequate inspection thus becomes a matter of paramount importance. Flat-plate floors, for example, are continuous over their supports, so that uneven settlement of foundations can create high stresses. Provision must be made in the design to resist these —generally an uneconomic measure—or the designer must assume no relative movement of supports, and field conditions must satisfy this assumption. This is an obligation of field inspection.

Flat-plate floors, it may be noted further, are relatively shallow. Consequently, small dimensional errors, such as in thickness of slab or location of reinforcing steel, are much more serious than for beam-and-slab construction. Length of reinforcing steel requires special attention because of the uncertainty of the exact location of inflection points. Checking these dimensions is another obligation of field inspection.

In flat-plate design, having concrete meet design specifications is highly important. Obviously, if the concrete is loaded before it has attained sufficient strength, or if the strength is not up to expectations, a failure during construction—when loads may be greater than when the structure is in service—is not surprising. Moreover, a widespread collapse is more likely to occur with flat-plate construction than with flat-slab or beam-and-slab construction, because flat plates have fewer "strong points." Similarly, it is highly important that design assumptions for loading be satisfied, principally that the forms be adequately shored and the slabs below re-shored. Field inspection is indispensable in preventing mishaps due to violation of these assumptions.

If one prime lesson, therefore, is to be drawn from the Scarsdale collapse, it is contained in the grand jury emphasis on "over-all engineering or professional supervision and inspection." Design must, of course, be competent, but the requirements of translating plans into structures are so exacting with flat-plate construction that more than ordinary precautions must be observed in the field. Continuous and competent inspection is the final safeguard against failure.

A kind word for Ft. Peck

FEW DAMS of major importance have been so much maligned in an economic sense as Ft. Peck. Too high on the Missouri River system to afford any effective flood control; too costly for the amount of irrigation water and power that it provides; these are the charges that usually are leveled against this greatest of all hydraulic-fill dams whose vast reservoir will hold nearly 20 million acre-ft of water.

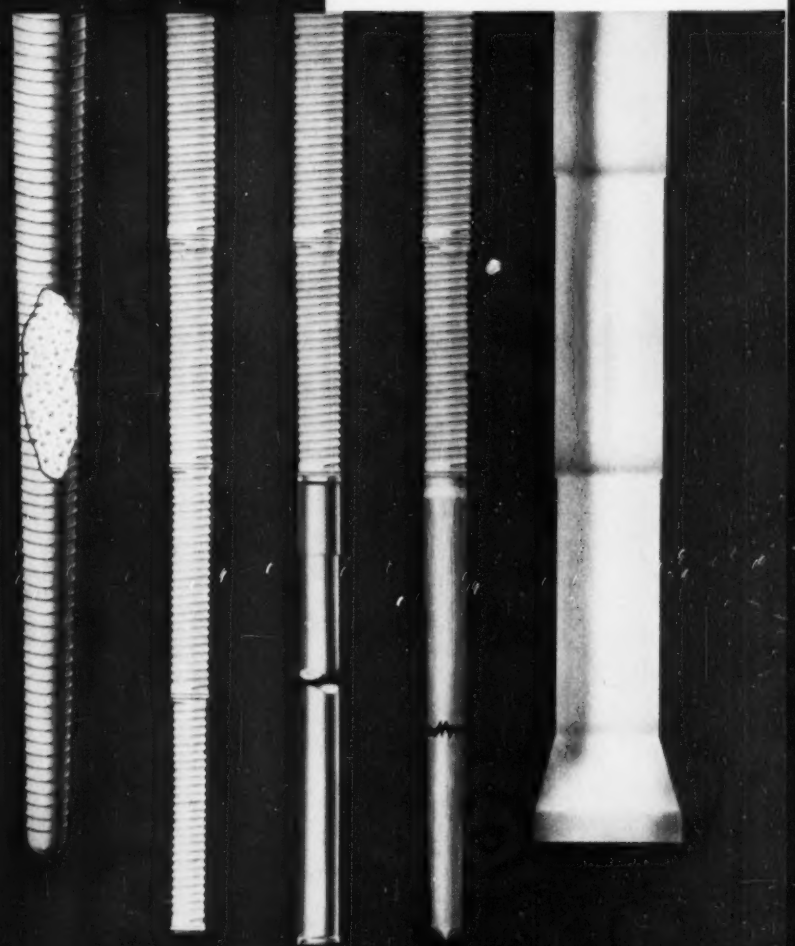
Actually Ft. Peck's main purpose is to assure an adequate flow in the river for navigation, and the news is that it has done this and more during the current drought. Not only has its released water permitted navigation to continue on the Missouri, but it has kept it from being curtailed on the Mississippi. Even New Orleans is said to have benefited. At Omaha 75% of the water in the river came from Ft. Peck, and at Kansas City both water supply and sanitation would have been threatened if the Ft. Peck supply had been cut off. For its service in the summer of 1953, at least, Ft. Peck is deserving of a few kind words. It performed according to plan.

engineered for the job!

*
ADVANTAGES OF RAYMOND CONCRETE PILES... Number four of a series

THE 5 TYPES OF RAYMOND PILES SHOWN... from left to right

- STANDARD • STEP-TAPER
- PIPE STEP-TAPER
- WOOD COMPOSITE • CAISSON



REGARDLESS of the subsoil conditions there's a Raymond Pile specifically designed to carry the required loads firmly and economically. Ideal as a friction pile is the Standard Pile with its heavy taper. Where hard ground must be reached at considerable depth below cutoff, the Step-Taper Pile is available. Where piles of very great length are required, the Pipe Step-Taper Pile is used. Wood Composite Piles combine the advantage of the permanence of concrete piles with the low cost of wood piles. Raymond Gow Caissons are efficient and economical for supporting heavy concentrated loads under certain soil conditions.

RAYMOND

CONCRETE PILE CO.

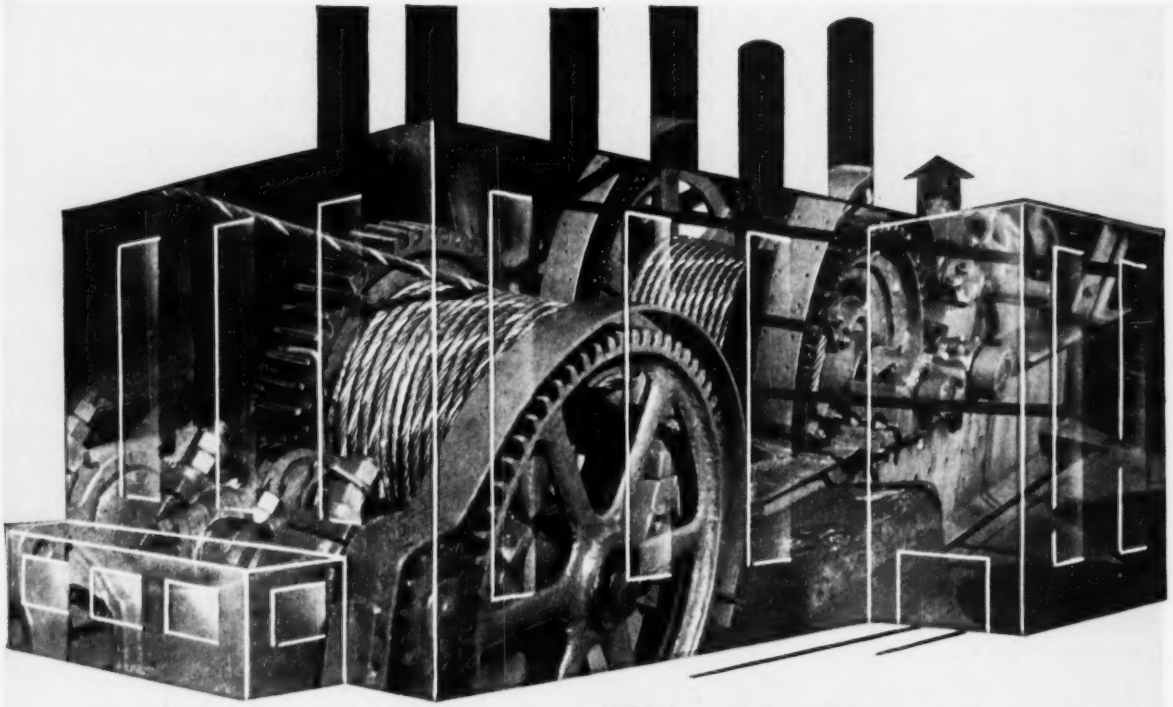
140 CEDAR STREET • NEW YORK 6, N. Y.

Branch Offices in Principal Cities of the United States, Central and South America

RAYMOND'S DOMESTIC SERVICES

Soil Investigations • Foundation Construction
Harbor and Waterfront Improvements
Prestressed Concrete Construction
Cement-mortar Lining of Water, Oil and Gas Pipelines, In Place

RAYMOND'S SERVICES ABROAD... In addition to the above, all types of General Construction.



BRODERICK & BASCOM

Yellow Strand®

PREFORMED WIRE ROPE

When *reserve power* is needed, will your wire rope come through?

Soft jobs are scarce. More and more you figure on pushing equipment to capacity, and to succeed you need wire rope with stamina to match. That's why we engineer a powerful reserve of strength and toughness into Preformed Yellow Strand. Whenever abnormal demands are caused by speed, shock, vibration or fatigue, the rope automatically works to minimize the effects and to forestall shutdowns. The exact rope construction for your application will be recommended by an engineer who is quick to grasp individual problems. How about getting together now?

Broderick & Bascom Rope Co.
St. Louis 15, Mo.

Branches:
New York, Chicago, Houston, Odessa, Tex., Los Angeles, San Francisco, Portland, Seattle

Factories:
St. Louis, Peoria, Houston, Seattle

Distributors in All Industrial Centers